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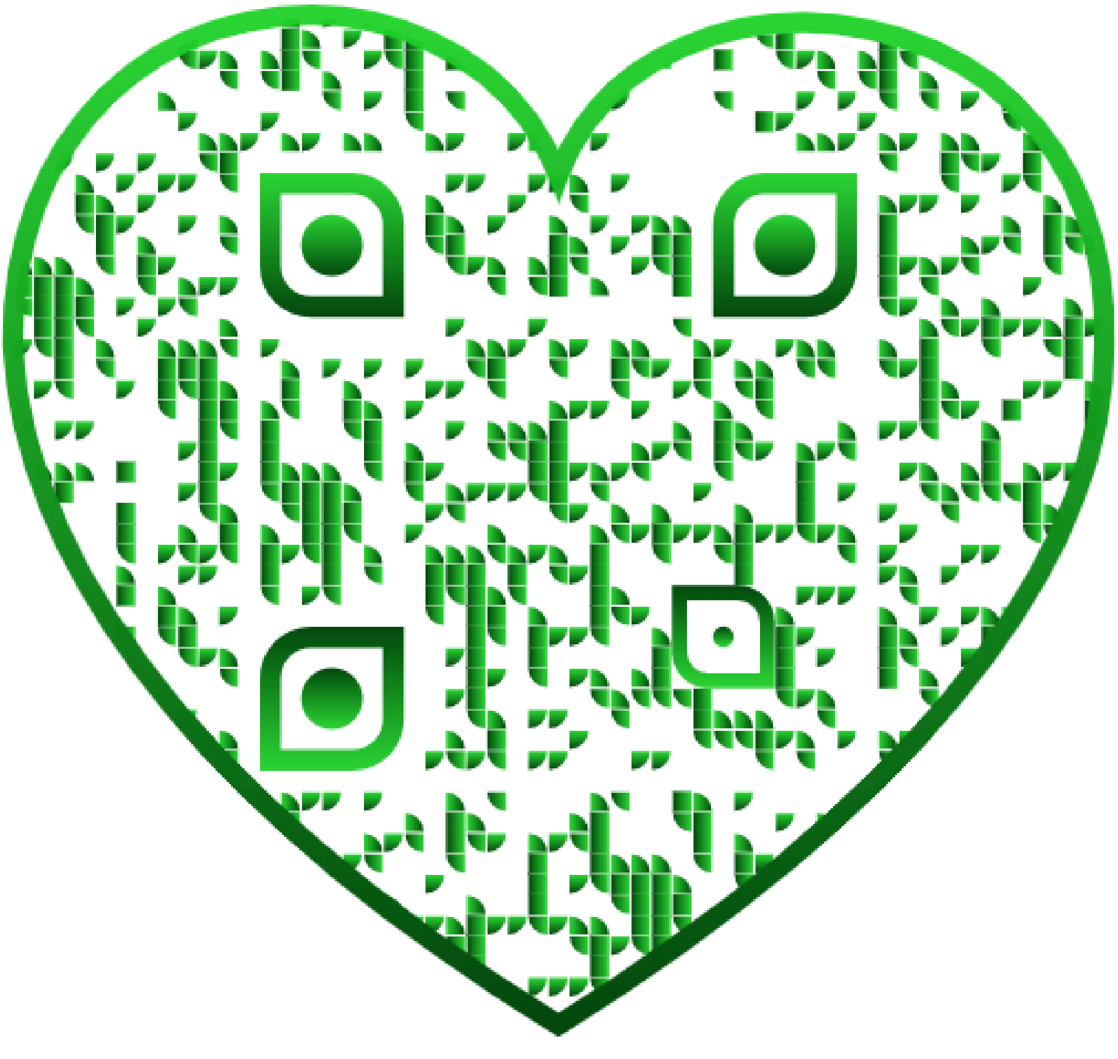
MANAGING THE MACHINE

What to do when there's nothing to do

NOVEMBER-DECEMBER 2025



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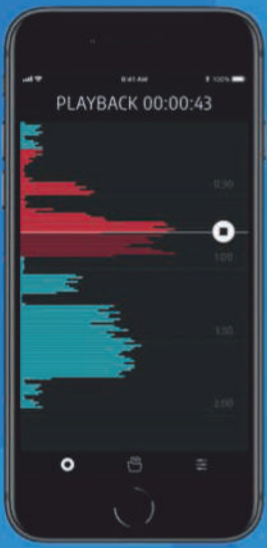
Cover: Filip Modrzejewski flies the Aura Integra in Poland

ZULU 4



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It was a beautiful spring day, inspiring me to throw down the roof of the car and commence my aviation playlist. Excited to be on the road again, I headed from Sydney to Temora for the inaugural Youth in Aviation event.

Where Pilots are Born

As the sky mocked me with its CAVOK weather, I bemoaned my lack of currency. Desperate to immerse myself in aviation, I decided to bear the humiliation of driving to an aviation event.

Temora holds a special place in my heart. Back when I was a young(er) writer, just starting out on my aviation flightpath, I visited Temora for Natfly. It was there I experienced my first homegrown airshow, and was wowed by its sense of community. Over time, I made friends with pilots who'd made the life-changing move to live at the airpark, and subsequent visits led me to overnight at the home of Carol and Sam Richards, who have become surrogate pilot-parents.

As someone with no pilots in my family, I gravitate towards pilots who make their home in aviation communities. Temora, like Rylestone, offers a wealth of these pilots, allowing me to spend my drive back daydreaming of the day I can leave the city and finally be among my people.

I adore airshows. I love nothing better than spending the day talking about aviation, catching up with old friends and colleagues and discovering what's new in GA. However, the Youth in Aviation event added a whole extra layer to the joy. Over 400 young people arrived on the morning of the event, to queue and hopefully score a free flight in one of 20 aircraft, which were offered on a first-come-first-served basis.

Each pilot had given up their time and expertise to take 104 of those young people on their first ever flight in a GA aircraft. One young man had driven with his father from Longreach, hopeful of a flight, and was utterly overjoyed to score a seat in Nick Wills' F1 Rocket. "He was the most enthusiastic young man I've ever met," Nick, an instructor who specialises in aerobatics, told me. "He was full of joy, and when I handed him the controls, he couldn't believe he was actually flying! When we experienced a loop, he whooped with excitement. It was sure worth the 17 hour drive from Longreach."

The crowd was also entertained by an aerial display from Paul Bennet, the Freedom Formation and the military. Helicopter rides, in an R44, were being offered by Riverina Helicopters for $90, and I experienced my first flight of the weekend. I shared my ride with a Temora local who was taking his 10 year old nephew on his first ever flight. There is absolutely nothing to match the feeling of seeing a young person experience flight for the first time, and when the young man said, 'how old do I have to be to start taking lessons?' I felt the same kind of joy as watching a baby be born.

At the evening's social event, where pizzas were donated by a local food truck, there was a vibe of achievement. Discussions were held to plan the next event, hopefully in 2027, and the realisation that positive action creates positive effects made the crowd buzz. Everyone was talking about the gratitude of the young pilots and the generosity of those who'd given up their time to spread their passion for aviation.

The next morning, I scored a flight in Nick Will's F1 Rocket, which gave me a thrill like no other. After our almost vertical take-off, we flew over Temora's yellow fields, turning loops in the sky. Nick's landing was such a greaser, I applauded.

Riding the high of my flight in one of the most exciting aircraft in GA, I then had a lesson in riveting from Sam Richards. After a little practise, I successfully made my own riveted piece for an upcoming RV7. "Only another 22,000 to go!" Sam quipped, and while I retorted, "I'll never fly in an aircraft I've had a hand in building!" He replied, "Oh, don't be so sure!"

As I headed back to Sydney, I pressed play on my daydream of returning to Temora, buying a piece of land and building (and riveting) my own tiny house and hangar, in which I would store my very own, hand built RV7A.

Kreisha Ballantyne – Editor

Flying

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Advertising Production:
John Viskovich

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Subscription Rates
1 year – 6 issues $51.00
1 year PLUS (print + digital) $57.00

AUSTRALIAN FLYING
is published by Yaffa Media Pty Ltd
ABN 54 002 699 354
17-21 Bellevue Street,
Surry Hills NSW 2010.
Ph: (02) 9281 2333

All Mail to:
GPO Box 606, Sydney, NSW 2001.

100 yaffa 1925 - 2025

Publisher: James Ostinga
Production Manager: Michelle Liebenbarg
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All contributions should be sent to the Editor on the above e-mail address.

Images should be supplied with a separate list of captions and the creator's name for each image. Please note that digital images MUST BE SUPPLIED AT A RESOLUTION OF AT LEAST 300DPI AT 15 CM ON THE LONG SIDE.

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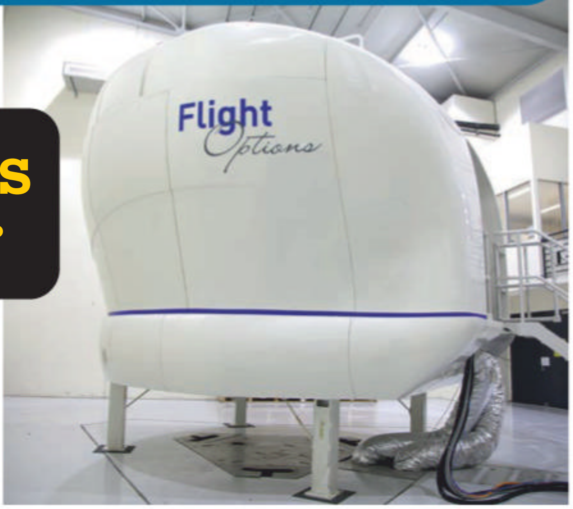
Flight Options Introduces Its New Airbus A320 Simulator



Flight Options, a leading Flight Simulator and Advanced Training Centre based on the Sunshine Coast, has reached a major milestone in aviation training with the launch of its Mechtronix Ascent Airbus A320 Flight Simulation Training Device (FSTD).

Now fully operational and available for bookings, this state-of-the-art simulator enhances Flight Options' advanced pilot and flight instructor training programs. It plays a vital role in supporting the aviation industry's efforts to address ongoing workforce deficiencies in training aircrew.

The introduction of refreshed, future-ready Professional Pilot Training Programs, including the region's best Multi Crew Cooperation (MCC) Course available, further strengthens Flight Options' commitment to training excellence.

In aviation for over half a century and with over 15 years of delivering high-quality, industry-recognised training, Flight Options has built a strong reputation for launching graduates into successful airline careers.

Originally established through a relationship with Singapore Flying College (a division of Singapore Airlines), the Flight Options Training Centre has grown into one of the largest privately-owned advanced simulation facilities in the Southern Hemisphere.

The centre offers comprehensive training across multiple aircraft types including the Beechcraft King Air and serves a diverse clientele throughout Australasia, Southeast Asia, and beyond.

Steve Padgett OAM, Founder and Managing Director of Flight Options, commented on the expansion: "This launch marks an exciting new chapter for Flight Options. By investing in additional simulators and expanding our training complex, we are reinforcing our commitment to delivering exceptional pilot training that meets the highest standards."

The new simulator will allow Flight Options to continue to meet the demand for specialised training and with this expansion is positioned to set a new benchmark, delivering unparalleled expertise and standards to pilots and airlines throughout the regions.

The new simulator will allow Flight Options to continue to meet the demand for specialised training

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Roaring Success for Temora's Youth in Aviation Event

It was a magnificent sunny day in Temora for the inaugural Youth in Aviation event, organised by The Temora Fliers.

20 pilots generously donated their time and expertise to take 104 hopeful young pilots their first taste of aviation. Six spectacular aerial displays, including many from Paul Bennet's team, kept the crowd entertained, while the Temora Aviation Museum offered free entry to the crowd.

Over 20 static displays, including CASA, Angel Flight, OzRunways, Tecnam and Paul Bennet Airshows, were on hand to showcase their products.

"What an incredible day! On behalf of the organising team, I want to extend my heartfelt thanks to everyone who helped make Youth in Aviation 2025 such a success," said event organiser Rob Matthews. "A very special thank you to Paul Bennet Airshows, whose skill, professionalism, and generosity brought so much excitement and joy to the day. We are deeply grateful for your ongoing support. Youth in Aviation continues to grow because of people like you who give your time, aircraft, and enthusiasm to inspire the next generation."

Freedom Formation pilot Mark Newton flew six young pilots in his Vans RV7, commenting, "It's been a long time coming, and I'm overjoyed that it turned out well after all the work Rob Matthews and the club at Temora put in to organising it. Not only was it a successful day in the Temora sunshine, but it was also a model that can be replicated across the country. I talked to people who travelled from Coffs Harbour and as far as Longreach; this wasn't just a "local" event, people came a long way to be part of it, and that tells me that there's a thirst for this kind of thing all over the place.

"This event was almost cookie-cutter compatible with the mission of Freedom Formation," he said. "We've always tried to inspire other people, our schtick is that anyone can do what we can do if they have access to an aircraft and enough training and determination. I'd love to think that some of the kids we helped fly over the weekend might "catch the bug" and grow up to be as obsessed with aviation as we are."

Discussing the future of the event, Newton would like to see a progression similar to the Young Eagles in the USA. "An American Young Eagle flight has the kid on the controls to get a taste and experience of that vivid tactile connection we have with our airplanes, the magical sensation of causing the aircraft to perform, instead of having a performance done to them," he said. "We can't do that in Australia because the Part 91 rewrite grandfathered-in the old rule that said only licensed pilots could handle the controls. If we could change it so that anyone could handle the controls as long as they were following the direct instructions of a qualified PIC like they can in FAA-land, that'd be the cherry on top. C'mon, CASA, work with SAAA, we can make this happen!"

The Temora Fliers plan to capitialise on the success of the event, with the next event in planning for 2027.

MAIN: Paul Bennet Airshows generously donated their time as part of the aerial display

RIGHT: 104 young pilots experienced their first taste of aviation

IMAGE: PAUL BENNET

IMAGE: KREISHA BALLANTYNE

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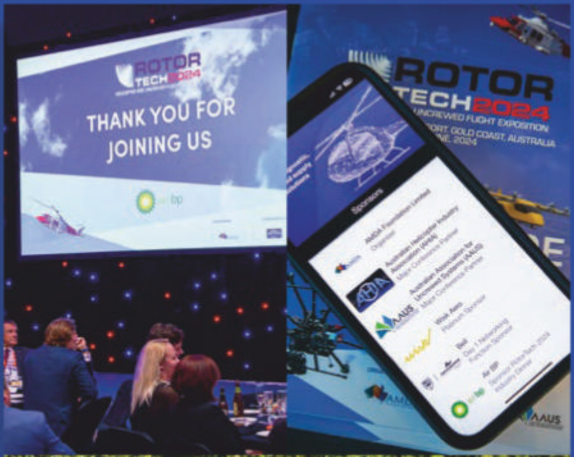

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Like Father, Like Son

Craig and Josh in their Beechcraft Bonanza

IMAGE: ANGEL FLIGHT

When Josh Hobart took to the skies on his first Angel Flight mission in April 2025, it wasn't just the start of a new chapter; it was the continuation of a proud family legacy.

Josh's father, Craig Hobart, has been flying for Angel Flight since 2006, clocking up 61 missions and serving as president of the Southport Flying Club. For Josh, watching his dad volunteer his flying skills to help rural Australians was not only inspiring, it helped shape his future.

"I've always been in the right-hand seat watching Dad fly," Josh reflects. "We even used to incorporate Angel Flights into our family holidays. It's always been part of our life."

Now 23 years old, Josh has completed 11 missions of his own and flies a Beechcraft Bonanza with over 500 flying hours under his belt. After completing a Bachelor of Aviation at Griffith University and training at the Australian Wings Academy, he moved to Lismore in late 2024 to finalise his commercial licence. A stint doing corporate flights helped him build the hours needed to follow in his father's footsteps.

"Flying for Angel Flight is rewarding in ways that go beyond aviation," says Josh. "It builds resilience, empathy, and perspective. I've flown to places I'd never been to before—like Tara and Mungindi—and seen firsthand how much the service means to people in remote areas."

He recalls one particularly moving flight, transporting a mother from Tara to surgery, accompanied by her neurodivergent daughter. "She thanked me for keeping her daughter calm. It really brought home how something as simple as a flight can change someone's experience during a difficult time."

Josh recently relocated to Airlie Beach to work as a scenic tour pilot over the Great Barrier Reef, but he's not ready to hang up his Angel Flight wings just yet.

"I'll keep volunteering whenever I can. I want to stay part of the Angel Flight family."

For the Hobarts, flying isn't just about altitude; it's about attitude. And together, this father-son duo is proving that the sky's not the limit when it comes to making a difference.

For more information on how to become an Angel Flight pilot visit www.angelflight.org.au/support-us/pilots/

Government explores Mandatory ADS-B for VFR

The Federal Government has published a consultation paper that proposes to mandate Automatic Dependent Surveillance - Broadcast Out (ADS-B Out) for aircraft operating under Visual Flight Rules (VFR).

Currently, ADS-B Out is mandated only for IFR aircraft, and fitment for VFR has been encouraged through a subsidy scheme in operation since 2022 and extended through to 2027.

However, the Federal Government is now proposing to make fitment for VFR mandatory from 2028, after the current subsidy is set to expire. It also proposed to mandate ADS-B In for IFR aircraft.

"Overall, the model proposes a staged introduction of ADS-B Out capability for all aircraft operating under VFR, including the use of approved electronic conspicuity (EC) device in some circumstances," the consultation paper explains.

"The model would see aircraft operating under VFR in class A, D, E and G airspace equipped with ADS-B Out from 2028. For Class D, E or G airspace, operators could choose between approved ADS-B equipment or approved EC devices.

"This would be supplemented in 2033 by a requirement for all capable aircraft operating in Class B and C airspace to be equipped with approved ADS-B equipment."

According to a Discussion Paper attached to the consultation document, ADS-B has a role to play in enhancing safety, and the government expects expanding the mandate to cover VFR aircraft will deliver the following benefits:

- reduce the risk of mid-air collisions
- facilitate safe integration of emerging aviation technologies
- improve the quality of air traffic services
- increase SAR rescue efficiency
- provide more information in accident investigations.

A significant motivation for forcing VFR aircraft to adopt ADS-B is the rapid growth of uncrewed aerial systems and the emergence of eVTOLs used in advanced air mobility (AAM) operations as early as 2032.

"It will produce benefits including increased 'visibility' for pilots of uncrewed aircraft, to more accurate provision of traffic information services and the resulting increased situational awareness, all of which can contribute to equitable access and shared responsibilities in airspace," the discussion paper notes.

Consultation will remain open until 27 October, available on the Department of Infrastructure website.

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Guardian of the Skies

Airservices Australia is responsible for managing the airspace above Australia, and well beyond its borders, which is no mean feat. **Benn Marks** takes a tour.

ABOVE: A vintage air traffic control console, complete with large radar screen, rotary buttons and an analogue handset, on display at Airservices Australia.

MAIN IMAGE: Airservices is responsible for overseeing and managing 11% of the world's airspace.

If you want to get really technical about it, the Australian Government-owned corporation is responsible for overseeing and managing 11% of the world's airspace. That's an enormous chunk of sky, almost 20 million sq nm of it, which constitutes a broad zone of sorts. A zone that covers all of Australia and extends above it, skirts Papua New Guinea (PNG) and Indonesia, before heading slightly up and out west from it, to roughly midway across the Indian Ocean, before dropping down to Antarctica, across it, and halfway up the Tasman Sea before reconnecting near the base of PNG again! Interesting, plus the organisation also provides upper-level airspace services under contract for the Solomon Islands and Nauru.

And it's also busy airspace, with Airservices not only responsible for clearing take-offs and landings at Australian airports, but for aircraft transiting that 11% of the world's airspace as well. In short, providing air navigation services to pilots operating aircraft across a valuable piece of three-dimensional real estate.

Therefore, the corporation's remit is plentiful, making sure that the non-stop, choreographed dance of aircraft departing and landing at Australian airports gels perfectly with those aircraft already aloft and making their way back and forth between Asia, Africa and the North and South American continents. The operative words in Airservices' lexicon being "the ability to prioritise" - where safety is never compromised. In this instance, aircraft movements, so that it all runs like a well-oiled machine. Which it does!

For operational numbers alone, there were 3.9m aircraft movements (take-offs and landings) and 155.7m passenger movements in Australia in (FY) 2024; also, there are 3,642 Airservices staff deployed across Australia, each doing their bit to contribute to the safe passage of both people and aircraft across a vital segment of the world's airspace.

The human element

But parking those details aside for the moment, the significant aspect in all of this is the human element; something which becomes quite apparent when observing the air traffic controllers (ATCs) in action, whether that be in Airservices' 75-metre tall Melbourne Air Traffic Control Tower with its wide, panoramic windows, or at its ground based Air Traffic Service Centre (ATSC) located in the same precinct just adjacent to Melbourne Airport (to the west of it).

Under observation, it becomes clear that the ATCs on duty work as one, like a well-oiled machine, where a calm composure, ability to prioritise, effectively communicate, combined with the ability to work well in a team setting are paramount. On that note, when viewing the ATCs in action, it's not really action at all. In fact, it's certainly not like anything in Hollywood blockbuster movies either, where deep breathing, raised voices and, in some cases, cursing breaks out to convey drama and tension; Airservices' control centres are the antithesis of those things. If anything, they're anti-drama, anti-tension; they're a sea of calm where, if there was an emergency, which can occur (as infrequently as they do), such as an aircraft experiencing an engine failure immediately after take-off, an outsider would never know. Why? Because procedures are calmly followed, clear communication is exercised, and tasks are prioritised then completed – all quietly and methodically, and the problem is safely resolved. Therefore, not surprisingly, Airservices' air traffic controllers appear to be a unique breed. They come across as calm, measured, and in control, just the type of people you want when it comes to making sure that aircraft, many flying above 500mph, are flying in clear and unobstructed skies, to wherever their final destination may be.

Not surprisingly, once selected, it can take up to 18 months to become one of these highly trained specialists with a Diploma of Aviation (Air Traffic Control) the result, with ongoing performance checks (every six months), plus written exams (every 12 months) to make sure they're at the pinnacle of their profession, slotted in amongst their standard work as ATCs! There are other forms of assessment, such as the requirement to maintain endorsement on specific positions in the tower, for instance, but the point being, the job is not for the faint-hearted.

Luckily for Australia though, there are lots of these highly trained, methodical operators guarding the skies, vigilant '24/7', seven days a week, 365 days a year.

More than one hat

Airservices is quite a broad organisation, which wears more than one hat. In fact, considering just a few other interesting facts and figures about it will reveal that there are currently 902 Air Traffic Controllers in Australia; and, there are 1002 Firefighters and 130-odd specialised fire trucks in the in the country too, as Airservices' remit also provides Aviation Rescue Fire Fighting services in addition to ATC services at 27 of the country's busiest airports.

In fact, Airservices' charter is simple, it is "responsible for Australia's airspace management, aeronautical information, aviation communications, navigation aids and technology, flight path changes and Aviation Rescue Fire Fighting Services."

However, in the context of ATC, which is a technically complex and dense one, it's perhaps easier to conceptualise how it works visually. That is, as a number of slices in a pie chart to fully appreciate and understand the activities, operational scope, and tasks that fall under the ATC banner.

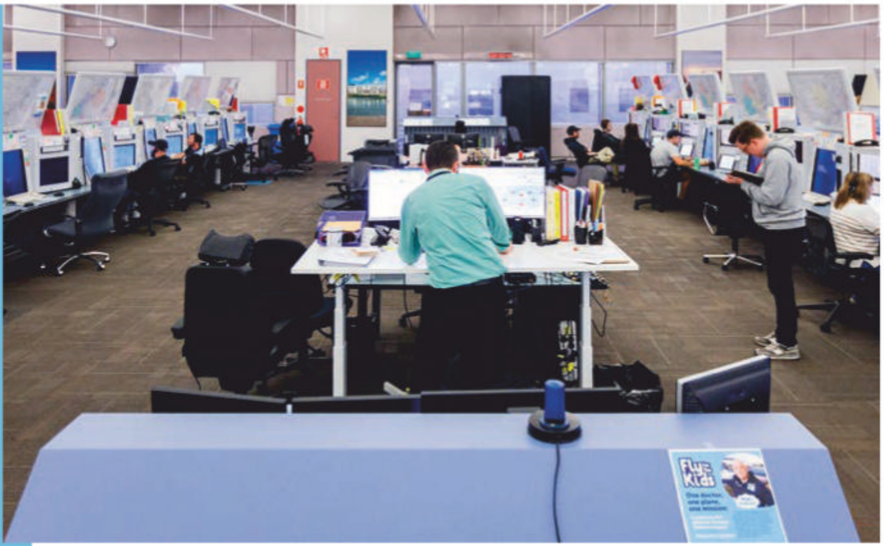
For example, as well as the 29 Air Traffic Control (ATC) towers that Airservices owns and operates

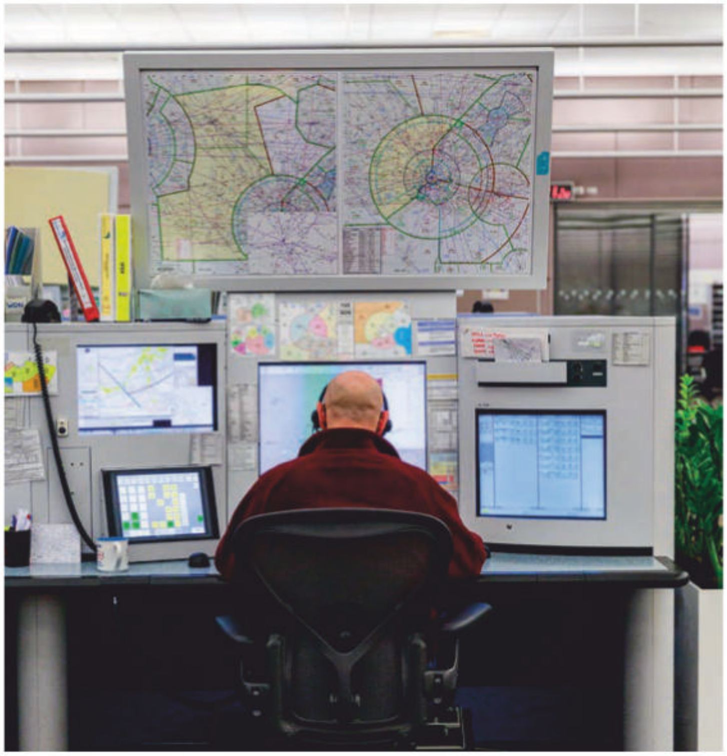
TOP: ATCs on duty work as one, like a well-oiled machine

MIDDLE: It can take up to 18 months to become one of these highly trained specialists with a Diploma of Aviation (Air Traffic Control)

BOTTOM: The operative words in Airservices' lexicon are "the ability to prioritise"

OPPOSITE: there are 902 Air Traffic Controllers in Australia.





in country, it also has two Air Traffic Service Centres (ATSC) in Melbourne and Brisbane, which are responsible and crucial for overseeing two distinct airspace zones (of that 11% chunk of global airspace previously mentioned). For instance, all airspace north of the dividing line that runs from Broome to Sydney falls under the management of the Brisbane ATSC, while all airspace south of that demarcation line falls under the management of the Melbourne ATSC. That is, that 11% of airspace that Airservices is responsible for is effectively divided into two regions: Brisbane Flight Information Region (FIR) and Melbourne FIR, or Northern flight region and Southern flight region.

The air traffic controllers working in the Brisbane and Melbourne ATSCs are tasked with safely guiding aircraft in, through and across the two FIRs before other international ATC jurisdictions pick up the mantle and take over. It is also in these two FIRs that the respective air traffic controllers provide all flight information and alerting services to aircraft flying in, through and across them. Sound complex? Kind of – but there's more!

To add a further level of complexity to the mix, the air traffic controllers that work in the building complexes of both Melbourne and Brisbane's ATSCs – referred to as en route controllers - sit at Eurocat workstations, which consist of an Air Situation Display (ASD), which shows crucial information such as real time air traffic disposition and sector layouts, plus other display information, as well as a Voice Communication System (VCS) that provides intercom between ATC units and radio frequencies to communicate with pilots. Critically, the en route controllers are responsible for the safe passage of aircraft flying in, through and across their respective sectors of the FIR before the aircraft flies into, across and out of the next enroute controller's sector in the aircraft's trajectory, and so on.

Consequently, and as to be expected, there are more ATCs working in the ATSCs of Melbourne and Brisbane than there are in their respective air traffic control towers, as a considerable amount of ATC work occurs there. That's certainly not to diminish the importance of the air traffic controllers working in the towers, as they all have their own segments of the pie chart, or in this case, their sector of aerodrome and airspace around it to look after (e.g., all vehicles and aircraft using the airport's taxiways and runways, plus those operating in the immediate vicinity of the airport too). Interestingly, Melbourne Air Traffic Control Tower manage up to 700 arrivals and departures at Melbourne Airport each day, so they're definitely kept on their feet.

It's also an example of teamwork at its best because a typical Melbourne to Sydney commercial aircraft flight will be safely monitored and controlled by up to 14 controllers and five supervisors from terminal gate to terminal gate, with pax none the wiser. The team responsible for coordinating such a feat will consist of tower controllers, terminal controllers and enroute controllers.

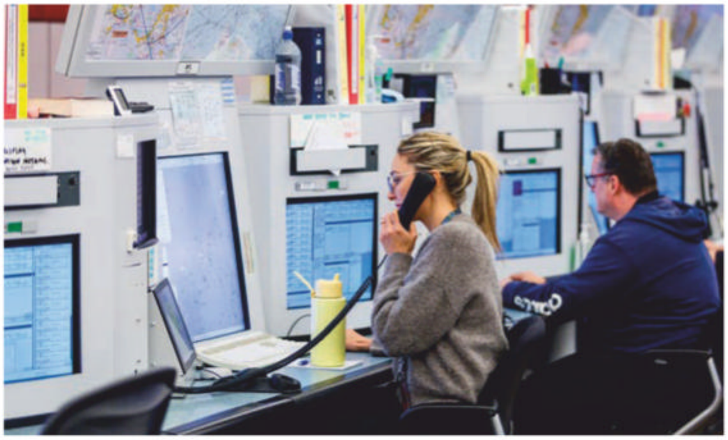
Airspace management

Additionally, the operational environment in which ATCs operate is further complicated when the concept of "controlled" and "uncontrolled airspace" is factored into the equation, and the classes of airspace operating within them as well!

But very briefly (and by no means exhaustively), the airspace from 0 to 12,500 feet is broadly classed as "uncontrolled airspace" where Airservices does not provide a separation service for aircraft in this lower altitude band, and pilots must adhere to "alerted see and avoid" principles, where aviators visually scan for traffic, perform radio broadcasts, review air traffic control flight information, plus other "give way" rules of the air. That's certainly not to say, however, that aircraft do not require clearances to take-off or land at any one of Australia's Airservices' administered airports - they certainly do. The airspace surrounding these airports (major airports - Class C, and GA and regional airports - Class D) is controlled. This lower altitude segment is generally the province of GA aircraft and helicopters (such as those aircraft / helicopters operating sightseeing flights, etc.) that are blind to ATC, but which must adhere to and abide by VFR and IFR conditions when flying at these lower altitudes. However, if an aircraft operating in uncontrolled airspace wishes to enter controlled airspace, it requires clearance from ATC to do so. Further to this, all airspace from 12,500 to 60,000 feet is where Airservices invigilates, monitors and controls aircraft movements (within that 11% of global airspace).

As mentioned previously, there's infinitely more to it, but the human element again is crucial in making it all just work.

In the context of Melbourne Airport for instance, which operates '24/7', there's always more than one ATC on deck to make sure that someone's got their eye on the ball. For example, the Melbourne Tower is fully staffed from 06:00 – 21:00 before the traffic becomes quieter and staff numbers change to align to traffic demand until the night shift comes in and takes over. Being a bit quieter at night, the night shift is staffed by two ATCs from 22:45 – 06:15, who then provide handover to the incoming morning team.



Advanced Air Traffic System

Augmenting the ATCs in performing their duties is the Australian Advanced Air Traffic System (AAATS), or TAAATS - comprehensive tech, such as the aforementioned Eurocat system, plus radar and other surveillance technology to track aircraft, which has enabled Airservices to perform its prime charter of air navigation services for the past thirty or so years.

But the tech is ageing, and change is certainly in the wind. Additionally, Airservices has had to play catch-up post-COVID-19, with the sheer increase in air traffic that

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has resulted from people wanting to travel again, combined with the fact that the broader ATC environment is changing dramatically too. Simply speaking, the skies are getting busier and busier. That is, not only are air traffic volumes increasing overall, but the simple reality is that airports are also having to bear the brunt of this tremendous growth, playing catch up building new infrastructure projects, which all takes time.

In the case of Melbourne Airport, for instance, a new third parallel north-south runway, which is expected to be completed by 2031, and a new airport in NSW - Western Sydney International (Nancy-Bird Walton) Airport (WSI) - slated to open in late 2026, are just some of the infrastructure projects currently being built to cope with the predicted growth in air traffic. Interestingly, also adding to it is the predicted "rise of the machines" in the form of drones. Airservices has indicated that by 2043 alone, "total drone flights are projected to grow to 60 million flights each year" – which is a staggering number. And to add even more ingredients into the already projected, overflowing mix, are urban air mobility (UAM) aircraft, autonomous aerial vehicles (AAV) and passenger AAVs – all forms of eVTOL aircraft that look set to stretch resources going forward even more so.

TOP: Despite all the systems, procedures and sophisticated tech that comprises Airservices, the human element in it is what reigns supreme.

BOTTOM: A typical Melbourne to Sydney commercial aircraft flight will be safely monitored and controlled by up to 14 controllers and five supervisors

OneSKY

But help is on the way in the form of OneSKY! A project that will completely transform air traffic services and management in Australia when it comes online in late 2027. The seeds for such a significant transformation were planted back in 2009 when the Federal Government at the time gave Airservices and the Department of Defence (DOD) the task of merging their two independent Air Traffic Control Management Systems into one, with the aim of streamlining the technology and operations between the civil and military arms of Australia's broad and expansive ATC environment. Briefly, the new system provided by Thales (a global technology provider for the defence, aerospace and space, cyber and digital industries) will, according to Airservices, replace "existing air traffic management systems with an advanced integrated system known as the Civil Military Air Traffic Management System (CMATS)."

Now well underway, OneSKY will essentially be a centralised and collaborative ATC system when it commences operation in late 2027. It will also be perhaps the most significant and complex undertaking in Australia's relatively long and rich aviation history when it does. Currently, not only are Australia's civil and military air traffic management systems ageing, but they also operate independently of one another, something which creates operational inefficiencies between the country's civil and military airspace environments.

Australia currently has 12 military bases with their own air traffic control systems (provided by Raytheon, the global defence and aerospace provider of advanced tech products, such as command and control systems, integrated air and missile defence systems, etc.) Being military, they have a different operational mandate (falling under the auspices of the DOD, which is responsible for military aviation operations and air traffic); an operational mandate which can periodically delay and impact the free-flowing passage of civil air traffic in and around these military sites.

But besides improving the efficiency of air services in Australia, OneSKY will also be able to keep pace with projected air traffic growth, as well as provide greater levels of safety, resilience and national security. Training is well underway, with both Airservices and ADF personnel getting up to speed with the new system, which is occurring in tandem with construction work of new and refurbished infrastructure at Melbourne and Brisbane's ATSCs. Many of the new systems are already in place, in line with OneSKY's official launch in late 2027. The new project is expected to yield enormous economic benefits to Australian airspace users to the tune of more than $2.7 billion over 20 years.

Despite all the systems, procedures and sophisticated tech that comprises Airservices, the human element in it is what reigns supreme. So, it's comforting to know that Airservices is standing guard and invigilating the airspace above Australia and beyond its borders.

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Managing the Machine

Steve Hitchen examines automation dependency and discovers why there will always be a place for the pilot in the cockpit.

Automation and robotics have obsoleted many job roles since human understanding about the capability of electronics has exploded. Car bodies used to be welded by hand, bank tellers used to be the dispensers of cash money and cutting tools were once crafted by hand. Automation has triggered the demise of these occupations and a lot more along the way.

And it seems that the next target of the automation proliferation could be pilots. With auto throttle, flight management systems, warning systems and even autoland performing roles once assigned to the flight crew, the reasons for humans in the cockpit are evaporating.

Not so fast.

Although automation in the form of autopilots has been around since 1912–only nine years after the first heavier-than-air flights–research into automation such as auto throttle and flight directors has revealed cracks in our understanding. Not so much in the automation itself, but in the interface between the box with the magic smoke and the human trying to master it.

But there is danger in assuming the problem comes down to the human or the machine. Although the combination has been blamed for disasters in the airline world, research is showing the solution lies in better understanding and proper training. No-one is suggesting the future is pilotless.

So, even in a world when Garmin Autoland can fly and land

IMAGE: WISK AERO

MAIN: Wisk eVTOLs at the 2032 Olympic Games in Brisbane will be piloted remotely, but the company says true urban mobility will rely on autonomous flight.

BELOW: Garmin Autoland give passengers the ability to safely land the aircraft in an emergency. Why then, can the technology not be used for day-to-day flight?

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IMAGE: GARMIN

a GA aeroplane with no human intervention, and Boeing is going full-steam at developing eVTOLs that fly themselves, there is still a place in the cockpit for pilots.

Air France 447

Bewilderingly notorious in the aviation sphere, the Air France 447 crash in June 2009 that killed 228 people is often pointed to the moment that cast doubt over the human-machine interface in aircraft cockpits.

Faced with the loss of airspeed indication due to icing, the autopilot disconnected. The flight crew responded poorly to the situation, leading to an aerodynamic stall that went undiagnosed until it was too late to stop the Airbus A330 from plunging into the Atlantic. Recap: three professional crew didn't detect a situation that a 15-hour student flying a Cessna 150 would recognise. How did this happen? How could it happen?

It was as simple as this: one pilot held his fly-by-wire side-stick back, the other held it forward. The contrary commands canceled-out each other and the nose remained too high. None of the crew understood the condition despite all the indicators being there.

And AF447 isn't alone in the annals of automation misunderstanding. Boeing 777 Asiana 214 hit the seawall on landing at San Francisco in 2013 after the pilot flying inadvertently de-activated the automatic speed control and the crew didn't monitor the airspeed adequately.

And also in 2009, Turkish Flight 1951 crashed on approach at Schipol Airport, when a faulty radio altimeter caused the autothrottle to roll back to idle. The crew didn't notice in time before the Boeing 738 stalled.

In all cases, the solution was in front of the crew, but a lack of understanding and sufficient monitoring blinded them to the correct course of action.

Salim Hijazeen is a PhD candidate and Associate Lecturer at Swinburne University's School of Engineering – Aviation Division. His organisation is learning more about automation and the human impacts on a regular basis.

"At Swinburne, we have conducted research into cockpit automation and pilot interaction using our Airbus A320 full-flight simulator," he explains. "In these studies, pilots are placed in scenarios such as low-visibility landings while their physiological and cognitive responses are measured through heart rate monitoring, stress-level tracking and eye-tracking systems.

"These data allow us to analyse how automation shapes pilot workload and situational awareness during critical phases of flight. The findings inform

IMAGE: IMAGES/STOCKBYM

IMAGE: TEXTRON AVIATION

ABOVE: A push for single-pilot operation is being driven by increased automation in airline cockpits.

RIGHT: Textron's Beechcraft Denali will carry the highest possible levels of automation when it is type certified.

OPPOSITE: A typical schematic showing how fly-by-wire adds to levels of automation in Airbus aeroplanes.

strategies to reduce stress, improve decision-making and strengthen crew resource management (CRM), which ultimately has implications for both training and safety standards."

Swinburne's research leads Hijazeen to conclude that whilst automation has its place in the cockpit to reduce workload and stress, accidents such as these quoted here show that a human is still needed.

"Certain functions depend on human judgment, empathy and leadership, and are unlikely ever to be automated," he believes. "A key example is the way pilots communicate with cabin crew, passengers and external stakeholders (such as ATC or emergency responders) during both normal and non-normal operations.

"These interactions involve psychological reassurance, trust-building and leadership under stress – qualities that no automation can substitute.

"More broadly, pilot roles that involve making novel risk trade-offs, managing uncertainty and exercising moral responsibility will remain human. For instance, deciding whether to divert in an unfolding medical emergency requires balancing operational, safety and human factors in ways that extend far beyond algorithms."

Dependent means

The International Civil Aviation Organisation has branded the problem "automation dependency". Shaken by AF447 and other incidents where pilots and automation have not been in sync, ICAO has tasked its Personnel Training and Licensing Panel to identify and present solutions.

Key among their findings is that pilots tend to lean on automation too much, which is corroding their flying skills because the skills don't get used. The issue compounds the longer it goes on. They depend on the automation to the point that when it goes wrong the human pilots aren't well prepared to take over and hand-fly.

But the problem is a paradox. Manufacturers of both aircraft and avionics encourage pilots to use the automation; it's there to make life easier and reduce human error and therefore should be employed to its greatest effect. Doing so, however, reduces the ability of the pilots to respond when the automation fails.

According to a report from the ICAO panel, policies and procedures don't prepare pilots to cope with circumstances where they need different levels of automation. Airlines and manufacturers don't provide guidance about when pilots should be flying manually and using the automation less.

The global aviation industry is beginning to see evidence that it has more to learn about the way humans and machines interact, and understand the need to modify procedures as new technology comes on line.

Training, too, is in the spotlight: ICAO has identified that cockpit competency is not so much a matter of automation or hand-flying, but is probably a combination of both in appropriate measures.

A 2018 study completed by two students from Hanseo University in South Korea and one from Leiden University in The Netherlands examined the issue of cockpit automation and human error, coming to the realisation that something needed to be done.

"First of all, excessive automation dependency must be reduced," Kwak, Choi and Choi concluded.

"Secondly, proper understanding of the automation technology is required. Thirdly, as the current standardised education system is not designed to actively cope with cockpit automation, it is urgent to introduce a new concentrated training system such as [Airline Orientation and Training Program], by analysing individual weaknesses."

Interestingly, airline pilots confronted with automation malfunction have a built-in solution if they have civil GA or military backgrounds: they turn the automation off and hand-fly, rather than try to use the system to fix the system.

Australia's best example came on 7 October 2008, when Airbus A330 QF72 suffered a major automation failure: incorrect data fed into the flight computer led to contradictory stall and overspeed indications and uncommanded pitching moments.

PIC Kevin Sullivan, a former F-4 Phantom and Mirage pilot, solved the issue by turning off the automation and hand-flying to a safe landing at RAAF Learmonth.

Yes, the focus is largely on airlines and heavy jet operations, but there are synergies with general aviation that are becoming stronger as the technological gap between the two narrows year upon year.

At GA level

The leap between Rockwell Collins avionics fitted to a Boeing and the Garmin Perspective Touch in a Cirrus SR22 is not a quantum one. GA avionics and automated systems are as sophisticated as those operated by the airlines and perform similar services in reducing cockpit workloads.

Salim Hijazeen: "In general aviation, automation has developed quite a bit over the past decade, such as the implementation of systems like Garmin Autoland and ADS-B In, directly preventing accidents.

"In the airlines, automation is already everywhere, so the benefits are more about consistency and workload reduction. This is why there is a great emphasis during flight training for manual flying."

However, except for those flying for short-haul airlines, GA pilots are not as chained to the automation by standard operating procedures. In the private sector, only training and the operating handbooks dictate when, where and how the automated systems are used.

There is nothing to stop pilots hand-flying the whole way, although IFR pilots would tell you life is much easier if you let George fly when there is nothing but grey murk out the windows.

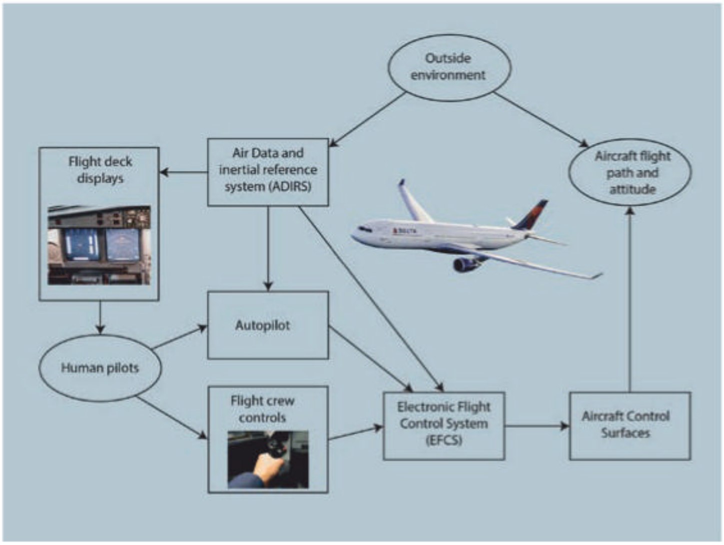
But in recent years, GA aircraft have adopted even more automation, to the point that the Cirrus SF50 and SR22, Piper M700 Fury, Daher TBM 960 and Epic G1000AX can all perform fully-automated landings including airport selection and communication with ATC. One push of the Garmin Autoland button does that.

So if all that can be done in an emergency, why not do it in everyday operations? Manufacturers tend to encourage pilots to use the automation they've been given, and certainly safety-critical systems such as envelope protection and anti-stall have taken safety to new levels, but still many GA pilots–particularly VFR types–still prefer to do the flying themselves, simply because that's what they're in the air to do.

That doesn't make GA pilots immune to automation dependency, and poor training or lack of familiarity with systems can produce errors along the lines of:

- unexpected automation behaviour
- task fixation whilst trying to program avionics
- sudden, short-term changes demanded by ATC causing stress
- diagnostic problem after an alarm
- not anticipating a need to change programming modes
- data entry error that need correction in flight
- indecision when automation disconnects.

It begs the question: if the human-machine interface is what is breaking down, why not remove


Outside environment
Flight deck displays
Air Data and inertial reference system (ADIRS)
Aircraft flight path and attitude
Autopilot
Human pilots
Flight crew controls
Electronic Flight Control System (EFCS)
Aircraft Control Surfaces

> **"if the human-machine interface is what is breaking down, why not remove the human from the equation?"**

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IMAGE: DASSAULT AVIATION

LEFT: Automation helps pilots reduce workload when managing complex aircraft like the Dassault Falcon 10X.

BELOW: BEA workers recover and preserve the avionics from Air France 447. Unfamiliarity and poor pilot response contributed to the disaster.

IMAGE: BUREAU D'ENQUÊTES ET D'ANALYSES

the human from the equation?

In August this year, the US Air Force said they had plans to deploy a completely automated Cessna Caravan to the Indo-Pacific region because the dispatch rate was often higher than conventional military aircraft and the cost almost one-tenth of something like a C-130.

If a military C208 can be automated, surely the time of autonomous Caravans carting midnight freight over short distances can't be that far away?

Hijazeen isn't convince of impending pilot obsolescence.

"Passenger airliners will continue to require human pilots because of the complexity of operations, the need for judgment in novel and non-normal situations, and the importance of passenger trust," he believes.

"However, autonomy is advancing in other domains. In Australia, upcoming advanced air mobility (AAM) aircraft may initially be deployed for roles such as medical transport or cargo, where operations are more controlled and risk exposure is lower."

AI

Dare we speak its name? The great pachyderm in the parlour in the automation debate is the influence and impact of artificial intelligence. Whilst AI wears the badge of the next great thing, it won't gain a foothold in aviation until people can be sure its integrity is good enough for safety-of-life situations. And even then, its future could be relegated to that of helper rather than hero.

"There may be some opportunities in which AI can assist pilots; however, it should not take over 100%," Hijazeen says. "Some potential applications of AI in aircraft for pilots may include an assistant in non-normal checklist procedures during flight and on-ground taxi guidance during poor weather."

Deep in the soul of AI is the ability for the machine to learn, but humans have little control over the lessons that it may learn and subsequently how the machine applies that lesson. This is what regulators are wary of.

Although National Aviation Authorities recognise the benefits of AI, certifying something that will learn and change poses problems. It can be done, but assurances need to be more robust than those needed with current autonomous systems.

Regulators will need to be completely satisfied that AI systems will produce consistent output for identical inputs, and understanding how the software arrives at conclusions and reacts to different situations is key.

But simply, AI may not be needed.

Boeing subsidiary, Wisk Aero, is aiming to have Advanced Air Mobility (AAM) up and about for the Brisbane Olympic Games in 2032. Initially, the Wisk eVTOL will be remotely-piloted, but the company admits that true AAM pivots on autonomy, the levels of which can be achieved by developing non-AI systems.

"Autonomy isn't artificial intelligence or machine learning," Wisk points out. "Instead, it means off-loading routine responsibilities that are traditionally held by human pilots to an autonomous system so that ground operators are free to make fewer, higher-level decisions."

None of this is an AI show-stopper for aviation; only Ostriches believe that AI is not coming. However, it won't supplant the person at the stick. That person, however, will need to be trained to sniff out an incorrect answer, response or reaction from an AI system, which means the pilot's place is set to endure.

Conclusion

Automation in aeroplane cockpits has introduced one of the great paradoxes to aviation. Designed to reduce pilots' workload and increase safety, cockpit automation is becoming a major cause of catastrophic accidents around the world.

Not so much the actual equipment itself, but faulty interaction between humans and machines that will probably ensure pilots are here forever.

In GA it's virtually guaranteed. Commercial operations continue to favour 40-year-old airframes that don't lend themselves particularly well to future-level automation, and for private operators, the pilot is the reason the aeroplane needs to fly, not the other way around.

But even when automation is in vogue, pilots will need to be there to check responses and make adjustment when the moment arises, or in the case of QF72, take back control when failures occur.

And if we can establish greater understanding at the human-machine coalface, automation may become the champion of safety rather than the cause of disaster.

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Keeping Track

What reference materials should a general aviation pilot keep within easy reach, and what information needs constant monitoring? **Paul Southwick** takes a closer look.

Memory lane reveals an evolution and trend towards automation and artificial intelligence (AI). In the early days, GA pilots would remember what they needed to in their heads, or use a pocket pen to write it on their hands. This was before laptops, computers, tablets, social media, mobile phones, digital cameras and glass cockpits. Pilot operating handbooks (POHs) were big, bulky volumes, stored and consulted as required. Difficult to store and refold maps, as well as charts, were all in printed form.

As flying became more complicated and regulated, notes would be taken with a pen or pencil on pieces of paper. Lines would be plotted and followed on printed paper maps. Those pieces of paper used to record things, slowly developed into standard logs or record sheets, often positioned on laps or kept between the seats, affixed to clip boards. Flight schools produced standard versions and pilots customised their own. The logs combined flight planning, navigation, fuel management, engine and flight times, and more. For all but local or training flights, logs became compulsory, especially the fuel component.

In 2010 Steve Jobs launched the Apple iPad, followed by the mini iPad. We're now up to Generation 11, and there are hundreds of millions of tablets in use, from multiple manufacturers. These devices have text and free drawing pages, which pilots find useful for flight recording.

The proliferation of iPads, their internet connectivity, increase in reliability, and powerful processors, accelerated the development and use of electronic flight bags (EFBs), with Foreflight having been founded in 2007, and AvPlan in Australia in 2010. EFBs were a godsend not just for flight planning but also keeping track of flights with moving maps and recording of key information, with often-used templates now

VFR FLIGHT PAD
DEPARTURE
DEPARTURE FREQS
CURRENT ATIS
NOTES
ARRIVAL
ARRIVAL FREQS
CLEARANCE INSTRUCTIONS
TAXI INSTRUCTIONS
LANDING CLEARANCE
made in China

ABOVE: The DA62 has an inbuilt checklist

LEFT: Entireflight's VFR Kneeboard and Flight Pad.731

MAIN IMAGE: With the advance of AI in general aviation, are we approaching or at a point where automation borders on the dangerous?

added. For example, CRAFT (Cleared to, Route, Altitude, Frequency, and Transponder code) for IFR flight clearances; recording the airport conditions (ATIS); and taxi clearances.

Recently we have seen the popularity of pre-printed sheets to record flight details, like those from EntireFlight, which make VFR and IFR pads in A5 size, where pages can be easily filled in, then ripped off, as you go. Coupled with the pre-filled sheets or individual pilot personalised sheets on A5 have come kneeboards, popular in military flying for years, which can be as simple as just a clip board, but also include places for pens, charts, checklists and more.

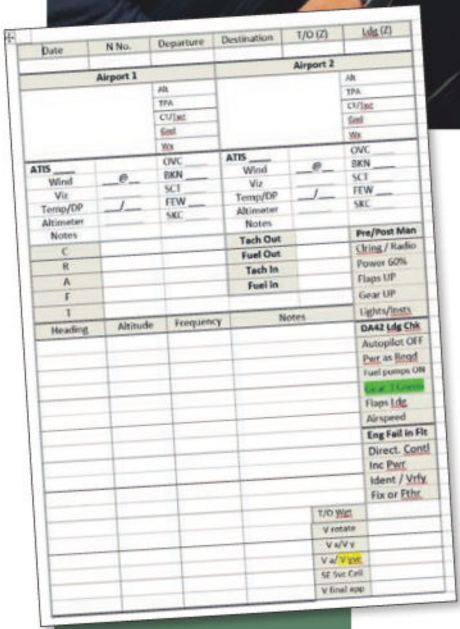
Modern times

The latest offerings of Garmin (and competitor) based cockpit systems include not just checklists, but navigation flight logs, airport and airways charts and maps, fuel used and remaining, with endurance and estimates of fuel at destination; POHs, including aircraft performance tables, normal and emergency procedures and system guides. There is even key speeds on the primary flight display like rotation, Vx and Vy. ATC calls are recorded and can be played back, and for some, forecast and actual weather, including graphics, as well as clearances and NOTAMs can be downloaded to the displays. Pilots can also make calls over built in satellite phones or listen to music. There are built in timers and alarms.

The suite of services available in modern aircraft are such that we are seeing a return to the early days of no (non-aircraft) recording devices being required. GA Pilots have nearly everything they need on the aircraft systems. Even iPads can go. Still hanging on though are mobile phones, often seen on knees, or in handy storage spots, used to quickly check weather or airport information.

With the advance of AI in general aviation, are we approaching or at a point where automation borders on the dangerous?

Says Jarod Rowe, head of operations at RACWA, and CASA testing officer says, "I'm seeing a trend where GA pilots are taking off, immediately pushing the autopilot button and not switching it off again until they're on final. This over reliance on technology is degrading stick and rudder skills. I've even had pilots tell me they use the TOGA button to set landing attitude!"



Date	N No.	Departure	Destination	T/O (Z)	Ldg (Z)

Airport 1
Alt
TPA
Ct/Inc
Gnd
Wx
ATIS ____
Wind ___@___
Viz
Temp/DP ___/___
Altimeter
Notes
OVC ____
BKN ____
SCT
FEW ____
SKC
C
R
A
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Airport 2
Alt
TPA
Ct/Inc
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Wx
ATIS ____
Wind ___@___
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Temp/DP ___/___
Altimeter
Notes
OVC
BKN ____
SCT
FEW ____
SKC
Tach Out
Fuel Out
Tach In
Fuel In

Pre/Post Man
Clring / Radio
Power 60%
Flaps UP
Gear UP
Lights/Insts

Heading	Altitude	Frequency	Notes

DA42 Ldg Chk
Autopilot OFF
Pwr as Reqd
Fuel pumps ON
Gear 3 Green
Flaps Ldg
Airspeed

Eng Fail in Flt
Direct. Contl
Inc Pwr
Ident / Vrfy
Fix or Fthr

T/O Wgt
V rotate
V x/V y
V a/V yse
SE Svc Ceil
V final app

CLOCKWISE FROM ABOVE:

US DA42NG pilot Trevor Moody's note pad.

Try not to look at notes too long or too low.

Noted chart at mid eye level.

The iPad is an instructor favourite.

Triple notes- charts clipped to control column, personal folder, and clipboard with pen.

Aussie example

Well known Australian Cirrus owner / vlogger, Stefan Drury, in a 2017 post, "Navigation flight log template – how I track fuel and estimates in flight," wrote, "I've been asked how I log my flight times and estimates in-flight. If you've watched any of my pilot vlogs on YouTube, you'd have seen I use a kneeboard strapped to my right leg which has a few pages in it. Firstly there's the flight log template (we'll get to that in a second), then I have a traffic page where I can write down any traffic that Air Traffic Control give me when flying IFR, or to note any traffic that I hear on the area frequency that might be a conflict even when I'm flying VFR. Then I have a sheet with some basic calculations I might need in flight (worst case take-off and landing distances, speeds for the aircraft I'm flying, etc) and finally lots and lots of spare sheets of paper to make notes and write down ATC instructions. The flight log I use has evolved over the years, I've kept each iteration..."

Regarding fuel, Drury writes, "I write the time of switching tanks to remind myself when to do the next change...Finally, the TAXI, CLR RTE stuff is for departures from a Class D aerodrome. Moorabbin, being my home airport and a Class D aerodrome, I usually depart IFR into controlled airspace and for that we need a clearance into Class C, plus a transponder code for IFR and our first frequency. I like to have the spaces pre-written on my flight plan so I can quickly write in the instructions when ATC give them to me (typically when taxying) rather than writing out a long clearance and frequency instruction when you're trying to avoid that C152 that's coming off the runway,"

"I then print a copy out in A5 and fill in all the bits I can before the day of a flight. Then once I have the weather for the flight, I fill in the remaining bits (HDG, GS, etc)."

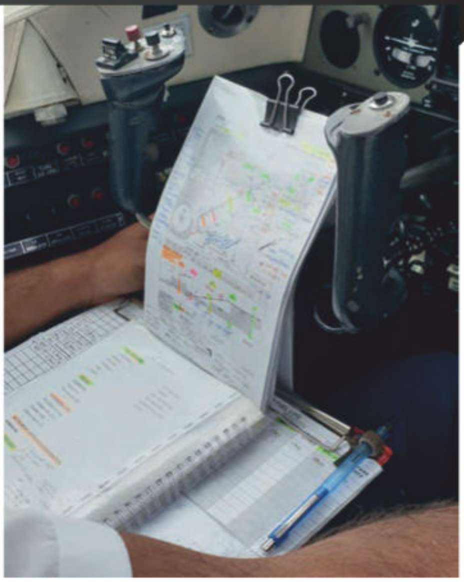
Rule changes

The Visual Flight Rules Guide (VFG), by CASA, says, under Navigation Logs, "This was formerly a requirement under CAR 78. However, keeping of navigation logs is not required under the CASR. Journey logs however are required for flights that begin or end outside Australian territory (refer CASR 91.120, MOS 5.02 and 5.03) and fuel monitoring [but not explicitly a log] is required (see CASR 91, MOS 19.05)."

AC-91-15 states in relation to checking in flight of fuel, particularly in 5.4.3 and 5.4.4: "In-flight fuel quantity checks must include a reconciliation of the fuel remaining indicated from available aircraft fuel quantity indication systems, such as debit-meters. Raw data, such as readings from fuel quantity gauges, should also be checked to confirm fuel balance and fuel tank quantity against known fuel usage to minimise the possibility of an undetected fuel leak. The maximum efficiency for fuel quantity checks is achieved when conducted at regular intervals that follow a consistently applied methodology."

"The intent of recording the in-flight fuel check results is to allow a time-based reference to previous in-flight fuel checks to be made so that trends can be identified. The recording of the relevant information can be achieved by many methods, including flight plan or fuel log written entry, photographing fuel gauges, or even in some advanced systems using a fuel quantity snapshot capture capability."

The MOS under "19.05 Procedures for determining fuel before flight and fuel monitoring



IAMGES: PAUL SOUTHWICK

during a flight" states, without specifically mentioning a log, the following:

"(1) The pilot in command of an aircraft for a flight must ensure that the amount of usable fuel on board the aircraft is determined before the flight commences.

(2) The pilot in command must ensure that the amount of fuel is checked at regular intervals throughout the flight, and that the usable fuel remaining is evaluated to:

(a) compare planned fuel consumption with actual fuel consumption; and

(b) determine the amount of usable fuel remaining; and

(c) determine whether the remaining usable fuel is sufficient to satisfy:

(i) if a point of in-flight replanning has been specified by the pilot in command for the flight and the flight has not proceeded past the point — the requirements of subsection 19.04 (2); and

(ii) otherwise — the requirements of subsection 19.04 (3); and

(d) determine the amount of usable fuel expected to be remaining when the aircraft lands at the destination aerodrome."

A practical example and test

Over recent years I've developed a hybrid note taking and recording solution that includes: an EFB for flight planning and transfer to the aircraft panel; the Garmin G1000 NXi or similar for fuel logs and monitoring, remembering how important the initial setting is, and the effect of headwinds or diversions; EntireFlight preprinted sheets clipped to a kneeboard, and attached to my right leg, with a pen and a spare for recording; and importantly a personalised book of key reminders and charts inside a blue Airservices Australia, A5 approach plate holder.

The EFB is unbeatable for route, weight and balance, airport selection, and fuel planning. The EntireFlight sheets become familiar after initial use and ensure I record all key information for flights.

My personalised book (with A5 pages that can be slid in or out) has two advantages. First, it meets the requirement, especially during IFR flights, for chart back up; and secondly, it is easily portable between the many aircraft types I fly, but with a familiar place to quickly find generic information I want to check, for example, circling restrictions, take off minima, conversions, or the effects of a blocked static or pitot tube. It is also adaptable when I fly different aircraft. For example, I like to have a quick reference sheet of key speeds for each aircraft – rotate, climb out, gear and flaps, downwind, final approach, cross wind and glide.

> **"Recently we have seen the popularity of pre-printed sheets to record flight details"**

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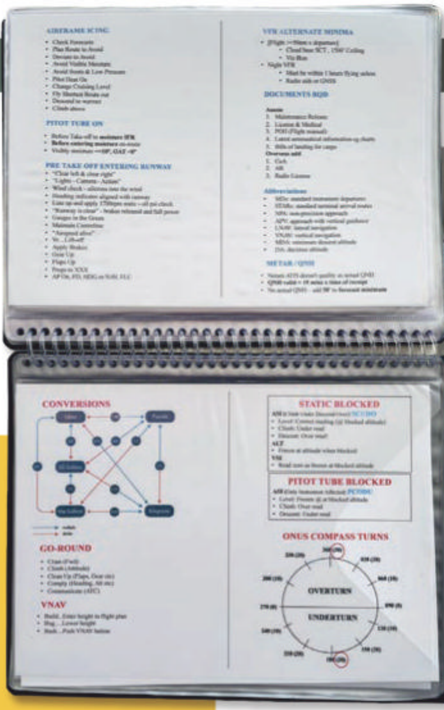

LEFT TO RIGHT: The author's quick refernece notes; Author with notes on the lap and iPad up high and with GoPro for revision in the Piper LX 2

Recently I tested the latest version of my record keeping and note taking with a flight in a low time Piper PA28 operated by Sydney Flight School at Bankstown.

Says Piper, "The perfect combination of durability, reliability, comfort and technology – the Archer TX is the ideal training platform. Students, instructors and passengers alike will welcome the one-of-a-kind TX with the Garmin G1000 NXi cockpit, and flight school owners will be delighted with the purchase and operating costs of this iconic trainer."

Our aircraft was VH-83C, striking in a dark blue with yellow streamer colour scheme. The plan was to make a VFR flight up the lane of entry, a run down the northern beaches, and return to Bankstown. Guide for the day was Grade 2 instructor, and international aerobatics pilot, Tristian Cheam.

Knowing that I would be flying an unfamiliar aircraft in busy controlled and uncontrolled airspace, before the flight I printed out needed airport charts, and key speeds for the Piper before slotting them into my Airservices Australia folder. I also prefilled my EntireFlight sheets with frequencies and other key information required for the flight. I drew a sketch diagram of the runways, and noted the different-by-runway required departure and arrival heights (1,500 and 1,000 feet) for quick reference.

Cheam, like a lot of instructors, in or near the training area, uses his iPad for everything in the cockpit. That includes AVPlan and Foreflight EFBs, recording the ATIS, ATC instructions and note taking for post flight debrief when instructing students, including those undertaking instructor ratings.

Lining up and rolling on runway 29R, I rotated at 65 kts and cruise climbed for good visibility at 88 knots. We turned right at 500 feet towards the increasing number of tall office blocks springing up at Paramatta. Passing skyscrapers off to the right, with views of the NRL stadium, I settled into the cruise. At 2,000' with 2370 RPM, we saw 111 KTAS, burning just 10.2 USG (38.62 litres) of Avgas per hour. Maximum cruise, with a higher fuel burn would be 128 KTAS.

Returning to Bankstown via the Prospect Reservoir reporting point (PSP), the ATIS had not changed, so I read details from the notes I wrote down before departure, and we joined downwind at 1,500 feet before being cleared for the visual approach. With the combination of NXI avionics, my kneepad, and book of charts and reminders, I could simply enjoy the flying, even in a strange-to-me aircraft and airspace.

Five Tips for flight planning

1 Use every aid available: Technology is there to make flying easier, fun, and safe. Use all of it to plan, monitor and record as many aspects of your flight as you can. In particular, if you are using the Garmin G1000 system, get familiar with the AUX pages that contain useful information regarding fuel used, flow, remaining, and estimated at destination, as well as flight times and engine temperatures and performance. Learn how to bring up pages for setting cruise power, performance, emergency procedures, and checklists.

2 Have back ups: Always have a backup, be it an iPad, iPhone or even paper. If using a paper system, have a way to secure your pen or pencil, and a spare. The same goes for an iPad pencil.

3 Develop your own quick reference system: Don't leave note taking, monitoring and recording to memory. With expert assistance, develop your own system; one that works for the flying you do, and use it consistently. Include not just the things you need to record from others, like the ATIS or clearances, but also information you might need quickly, like glide speed or immediate actions in an emergency. If they suit you, make use of pre-printed scratch pads on an EFB, or physically printed – be that your own or something commercially available.

4 Keep your eyes outside: Ideally, notes should be taken and read at or near eye level. If the notes are in your lap, or on your knee, affix them so they don't move during take-off, turbulence, or landing (and jam the controls). Be careful looking down too quickly to make or read notes, or for too long, so as to avoid banging into something expensive when taxiing, or spatial disorientation when in the air (especially in IMC).

5 Adjust the notes for different flights: Vary the type and depth of notes you prepare and take, depending upon the nature of the flight. For example, for a short flight to the training or local area, brief notes scribbled on a tablet or piece of paper may suffice. For a long cross country, a detailed note and reference system will be safest, especially fuel monitoring and clearances. Whatever you do, be consistent, and don't ever skimp on best practice.

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AEROPRAKT-32

Deciphering the MOSAIC Code

New-age LSA look set to bring sweeping changes to general aviation. **Steve Hitchen** looks inside the MOSAIC rules to find out what it means for Australia.

It's not often a regulator gifts an industry more than the industry was asking for, but with several factors, that's what the US Federal Aviation Authority (FAA) has done with the new rules surrounding light sport aircraft (LSA).

New rules, known as the MOSAIC rules (an acronym for Modernisation of Special Airworthiness Category), will bring sweeping changes to LSAs and how they are governed in the USA. Desperately needed to update 20-year-old regulations, MOSAIC will make LSAs larger, faster, more capable and enhance them with modern technology.

Much of the new tide in the USA will splash over to Australia, most spectacularly in the form of new aircraft, but the extent of the inflow

MAIN: LSA were designed to be simple, single-engined pistons, but the new FAR Part 22 stands to take them to new levels of performance.

LEFT TOP: Jabiru's J432M may now be offered as a twin-engined LSA.

BOTTOM RIGHT: The LSA category has been a happy testing ground for new avionics not specifically banned under LSA standards.

will depend on CASA and their attitudes toward the capability of LSAs and what safety mitigators, if any, need to be put in play.

At the time of writing, CASA people are still wading through the 700-page ruleset to filter out the changes MOSAIC may bring, but the sounds coming from Canberra on the matter indicate they are as excited about this as the rest of the GA community.

Part of the complexity with the regulation is that much of the document won't apply in Australia in the strictest sense; the FAA is heralding changes to the aircraft, the way they are operated and who can operate them.

MOSAIC envisages LSAs in some commercial operations (currently CASA frowns upon this) and removing the limits on their Sport Pilot Licence to allow unlimited MTOWs (the SPL is roughly equivalent to our RPC, but is FAA-administered). Both these changes will empower owners to take full advantage of the new capability, but will trigger a cascade of alterations to other rulesets.

So, MOSAIC is a complete suite of regulations that has the US GA community buzzing with excitement.

"GAMA welcomes [the] announcement on MOSAIC," said General Aviation Manufacturers Association president, James Viola. "While we will need to review the final rule in more detail, GAMA deeply appreciates the efforts of Secretary Duffy, the US Department of Transportation, FAA and the US Congress for their efforts to continuously improve safety and innovation in general aviation and bring MOSAIC to fruition.

"The MOSAIC rule expands the scope of light sport aircraft category, reducing regulatory burden consistent with the FAA safety continuum that will in turn support opportunities to improve certification processes for Part 23 aircraft.

"This rule plays a crucial role to ensure the US regulatory structure is better designed to advance safety, innovation and the utility of general aviation.

"[MOSAIC] is an essential step forward for advancing the future of the general aviation industry."

Over time, the name MOSAIC will disappear, supplanted with the regulation FAR Part 22. CASA already has a CASR Part 22 on airworthiness for sailplanes, which means the new regs will need a different title in Australia.

Motivation for change

Light Sport 101: an LSA is an aircraft with a maximum take-off weight of 600 kg for land planes (650 kg for seaplanes), with a single normally-aspirated piston engine, two seats and fixed undercarriage (repositionable for seaplanes). LSAs are not type-certified by a National Aviation Authority like CASA, EASA or the FAA, rather the manufacturer themselves is responsible for ensuring they comply with an existing standard.

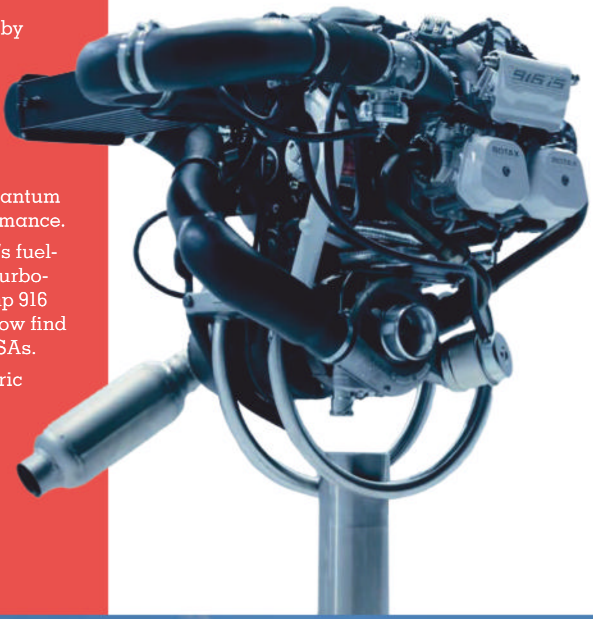
The FAA introduced LSAs mirroring consensus standard ASTM F2245 among others in 2004; CASA adopted it in modified form two years later. The main variation between the ASTM and CASA is that CASA deleted a 120 kt maximum speed and permitted constant speed propellers.

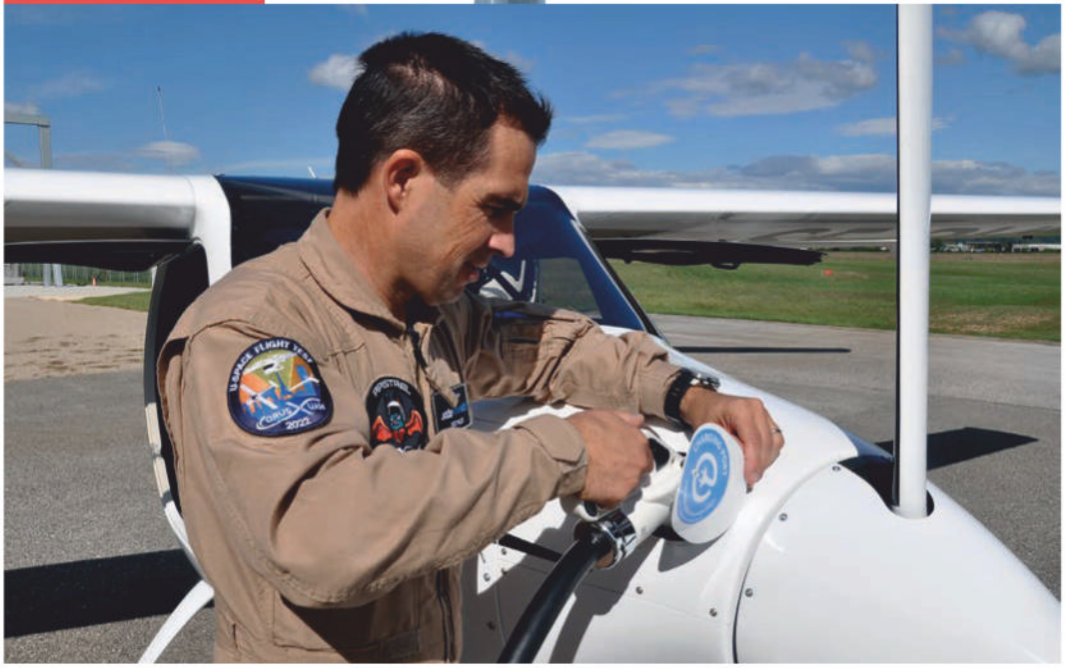
LSAs can be registered with CASA or with RAAus and flown by licensed pilots or RPC holders. However, LSAs can't be used for most commercial flying; banner and glider towing, and flight training the notable exceptions.

The problem now is that the standard is 20 years old and written with an inflexibility that can't encompass new technology and therefore new levels of safety. Rotax's new range of turbo-charged engines are not permitted in LSAs. Aircraft are built to be a light as possible to increase their useful load, reducing practical wing loading and generally making them more skittish in turbulence and vulnerable to savage crosswinds.

Another motivating factor for the FAA, reinforced several times in the ruleset explanation, is that they want to encourage pilots who would build their own aeroplane to instead buy an enhanced LSA built by a professional manufacturer.

"EAB [Experimental Amateur-built] have not been found to meet





ABOVE: Brumby Aircraft has been preparing for the new LSA for some time, and has seen a quantum leap in performance.

RIGHT: Rotax's fuel-injected and turbo-charged 160-hp 916 engine may now find its way into LSAs.

BELOW: Electric aircraft can now be LSAs, which is expected to accelerate development.

FAA or FAA-accepted design or production standards and therefore present a higher level of risk," the FAA states.

"FAA mitigates that risk for EAB via operating limitations that reduce the risk to the public. Light-sport category aircraft under this rule are subject to a higher rigor in certification requirements and procedures for design, production, and airworthiness than EAB aircraft.

"Therefore, light-sport category aircraft are higher on the safety continuum than EAB aircraft and can be operated under less restrictive operating limitations than EAB aircraft."

That position is not necessarily that of the GA community at large, but in the end is helping bring MOSAIC to reality.

Is this wizard for Oz?

There are almost no extant indications that the new LSA rules won't have a transforming impact on general aviation in Australia. Largely, the GA community is embracing this change like they've been released from prison.

Cowra's Brumby Aircraft will have a standard to which they can manufacture and sell their Brumby 760 (currently a kit-build offering only) and Jabiru's J230/430 airframe will finally be allowed to fly at the 760 kg MTOW that it was originally tested to. MOSAIC will enable both without the manufacturers having to pursue wallet-emptying type certification.

But 760 kg is not the limit of the sky by any means. For example, Brumby owns the type certificate for the Victa Aircruiser, of which only one was ever built. That aircraft is likely to fit under FAR Part 22 rules, and after nearly 60 years, it may achieve its production destiny yet as an LSA even with an MTOW exceeding 1000 kg.

The exact impact is still mostly conjecture, with some consensus around the potential for new and expanded designs to usurp the traditional GA models, leading to the perhaps overdue retirement of a lot of legacy airframes. Unshackled by the need to build for weight, metal-clad LSAs could be more attractive for flying schools due their ability to take a greater beating from students.

All that is fantastic news, but what will MOSAIC deliver to aircraft owners in real terms?

At the stall

Perhaps the greatest surprise from MOSAIC is a maximum stall speed of 61 KCAS. The US GA community had predicted, and expected, 54 KCAS. The 2004 LSA standard permitted only 45 knots. As a quick benchmark, a C172R will stall at 51 KCAS. With the MTOW limit removed, the clean stall at worst CoG will become the defining factor for LSAs.

The new stall speed reflects a change in philosophy from defining an LSA by physical characteristics, to defining by performance. In turn, that change has been possible only after 20 years of experience with the category showing that LSAs were ready to become something more capable and still remain safe.

According to the FAA, 61 KCAS has been chosen as the new stall speed limit in FAR Part 22 because it is "a compromise between the proposed stall speed that would provide lower kinetic energy for survivable emergency landings and one that could achieve safe operations of heavier airplanes allowed by this rule”.

Weighing in

Under FAR Part 22, an LSA can have whatever maximum take-off weight the manufacturer wants to give their design, provided it complies with all the parameters dictated in the standard. The figure impacting MTOW the most will be the generous 61 KCAS stall speed.

When 54 KCAS was touted, coaster calculations resulted in MTOWs of around 1320 kg to comply. The extra 7 KCAS now has engineers talking about a potential 2000 kg. More benchmarking: a Beechcraft G36 Bonanza has an MTOW of 1732 kg.

In a way only a regulator could do, the FAA explained the reasoning for removing the weight limit in one long sentence. Though verbatim, we will quote it.

“Removing the weight restriction on light-sport category aircraft would provide manufacturers opportunities to incorporate additional safety-enhancing designs and equipment; design airframes that are more rugged for the flight-training environment; increase fuel load and aircraft range; allow for greater cabin size to enable greater occupant heights and weights; improve aircraft handling in gusts, turbulence, and crosswinds; and increase the suitability of light-sport category aircraft for other intended operating purposes, including recreation and personal travel.”

“change has been possible only after 20 years of experience with the category”

Constraints on basic empty weight (BEW) to give LSA customers a good useful load has contributed to the spread of composite construction; traditional metal was a luxury many couldn’t afford. With the shackles gone, metal structures may make a comeback, meaning the aircraft can be stored outside in the elements where composites fear to live.

Shapes of coming things

Under the original LSA concept, aeroplanes (and they were all aeroplanes) were entitled to be simple, non-complex aircraft that didn’t take a lot of training or extraordinary skill to master.

Consequently, authors of the standard eliminated anything they considered not compatible with that philosophy. LSAs of 2004 were not permitted to have retractable undercarriage, had to have a piston engine with a fixed-pitch or ground-adjustable propeller, turbo-chargers were banned and don’t even think about a turbine or an electric motor!

And it had to be an aeroplane; helicopters and gyrocopters were not welcome in the LSA category. Neither were twins.

But now, after two decades of experience with the sector, the FAA has done a volte-face and embraced equipment that’s consistent with the aims of increased safety and capability.

“With the performance expansions in this final rule for the design of light-sport category aircraft, there is no longer a need to restrict light-sport category aircraft to a single reciprocating engine or a fixed or ground-adjustable propeller,” the FAA explains.

“Removing these restrictions is necessary for the introduction of powered-lift and certain rotorcraft, for example, electric vertical take-off and landing (eVTOL), into the light-sport category.

“It will also allow for the development of light-sport category twin-engine airplanes that require

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a feathered propeller for single engine emergency operations. These changes will also enable the development of new technologies, including electric, hydrogen, and hybrid engines and motors."

That opens the door for Rotax's range of 914, 915 and 916 turbo-charged engines to power LSAs and presents opportunities for electric aircraft manufacturers like Pipistrel to avoid costly type-certification in new designs.

And removing the piston requirement brings into play engines like TurbAero's Talon turbo-prop, which is currently supplied to builders of experimental types.

Another motivating factor to open up the category is the emergence of eVTOLs, which are expected to carve a niche in the private aviation market sometime in the 2030s. Just about everything that characterises eVTOLs was banned under existing LSA rules.

A twin turbo-prop LSA? Provided it will stall at or under 61 KCAS, it can't be ruled out.

Vickers Aircraft increased the MTOW of their Wave amphibious LSA to 907 kg in anticipation of FAR Part 22 coming in.

CASA's dilemma

CASA has been openly supportive and as excited by the potential of newer and bigger LSAs, but is troubled by how to deal with the unique split administration system we have here in Australia.

CASR Part 149 empowers Approved Self-administering Aviation Organisations (ASAO) like RAAus to administer the current LSA standard to 600 kg, and recently type-certified or home-built aircraft up to 760 kg.

But what do they do about the open-ended MTOW of the MOSAIC standard?

"CASA has been closely watching and engaging with the US FAA as they developed their policy and we welcome the release of their final rules and framework for the future," a CASA spokesperson told *Australian Flying*.

"We have reviewed draft versions of the FAA [MOSAIC] policy and whilst we have been aware of some of the major changes in the proposal, we are only seeing the final detail now it has been publicly released.

"We considered what we reviewed so far to be good policy, but need to review the final rules in the context of Australian operations, including how it would apply in the context of Part 149 Approved Self-Administering Aviation Organisations.

"It is likely that some of the initiatives will be easier to implement than others, and in some cases may already be part of our regulatory framework.

"For example, the new US FAA rules will allow some commercial aerial work operations by recreational aircraft, in Australia we already allow commercial activities such as towing banners/gliders/flying training.

"We are committed to reducing regulatory burden on general aviation, ensuring that regulation is proportionate to risk and that we maximise flexibility for the sector while maintaining an appropriate level of safety."

Under former CEO Matt Bouttell (now, coincidentally Executive Manager – Regulatory Oversight at CASA), RAAus was adamant they would lobby CASA for permission to administer Part 22 aircraft to their fullest extent.

But that extent enables four-seat aircraft, something that the organisation has not embraced in the past and even declared a lack of interest in putting on their books. Note: four seats does not necessarily mean the privilege of carrying an extra two passengers, just an extra two seats.

Current RAAus management duo CEO Maxine Milera and Chief of Aviation Cody Calder are not as forthcoming with their MOSAIC aspirations, and at the time of writing, have not published any official policy.

That doesn't mean there isn't one; just that it hasn't been published.

In August, Milera responded to questions from *Australian Flying*, stating somewhat cryptically, "RAAus has met with CASA to discuss the matter and expressed our support for CASA to adopt MOSAIC standard, which would enable more permitted activities and access to larger aircraft."

The GA community can draw from that with a level of accuracy that RAAus wants the full MOSAIC monty when it comes to derived MTOWs and expanded commercial operations, but it's important to note that Milera hasn't said whether they have lobbied CASA to adopt FAR Part 22 with or without extending privileges to RAAus.

Ideally, the paragraphs above will have been rendered moot by the time you read this with a definitive statement from RAAus.

The upshot

Technology makes things easier; technology makes things safer. If it didn't, no-one would ever adopt it. It follows logically then that the FAA would re-write the LSA rules to allow new technology to flow into the category.

But there is still some resistance; MOSAIC has detractors, albeit not many of them. The contention there is that LSAs should stay simple and non-complex because that was the original intention of the ruleset. Anything more than that should require certification.

They are voices in the wilderness; acknowledged but not complied with.

And think about this: the absence of certification permitted LSA builders to introduce new technology that wasn't specifically banned by the standard, particularly in the world of avionics. Introducing new equipment converted the LSA category into a real-life testing ground, which then informed certified equipment for the higher category.

Broadening the scope for LSAs means the testing ground will get larger and new developments flow into the certified category more easily.

MOSAIC and FAR Part 22 are revolutionary and have momentum to make changes to general aviation the like of which we haven't seen since the first metal airframes of the 1960s.

Renaissance is on our doorstep. It's time we let it in.

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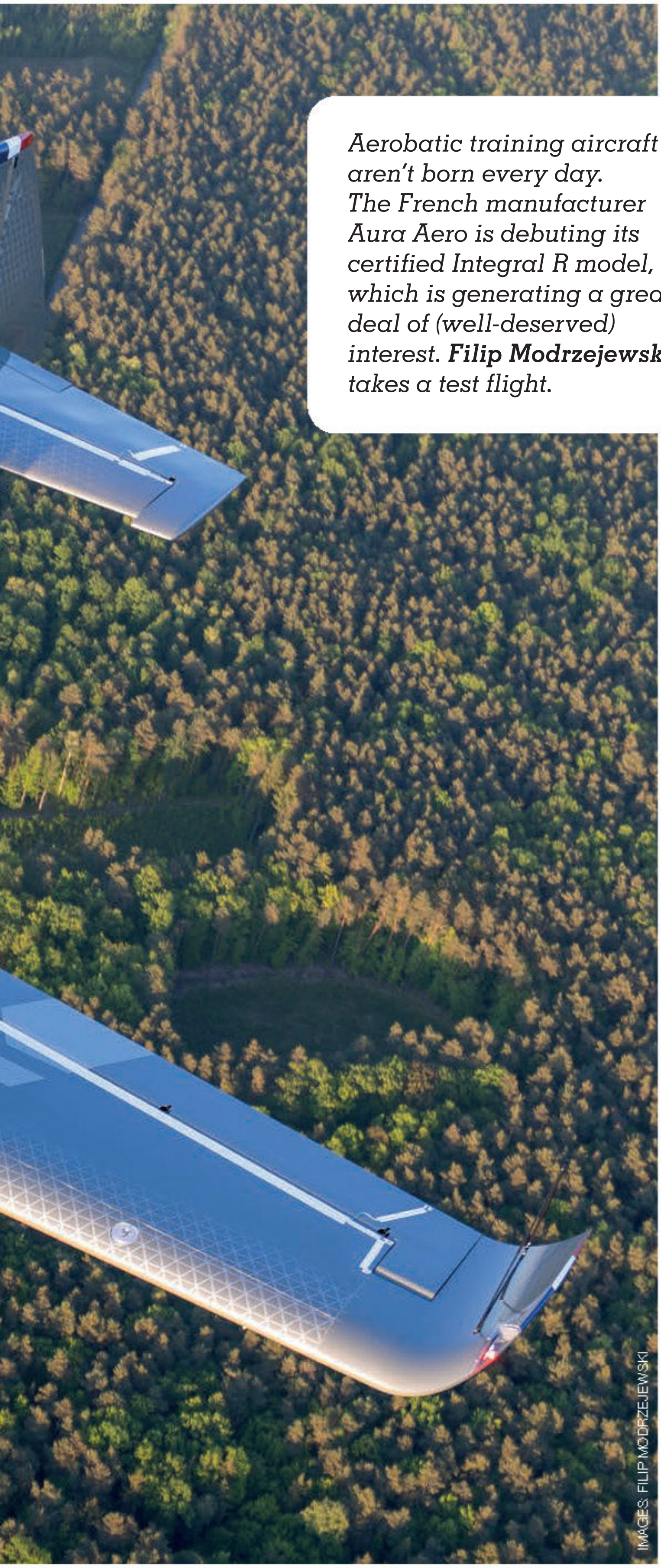
The grey paint scheme with French accents looks stunning in the golden light of the setting sun.



IMAGES: FILIP MODRZEJEWSKI

Aerobatic training aircraft aren't born every day. The French manufacturer Aura Aero is debuting its certified Integral R model, which is generating a great deal of (well-deserved) interest. ***Filip Modrzejewski*** *takes a test flight.*

I had this aircraft on my radar for quite some time. Friends from both Poland and the UK had mentioned it to me as a model they were considering to improve their fleets for aerobatics and UPRT training, so it's clearly generating a lot of interest. The aircraft makes a strong impression both in terms of design and aesthetics, and after my first aerobatic flight in this model, I was even more convinced of its potential… but let's take a closer look, step by step.

Integral R in Poland

At the beginning of this year, the aircraft received full EASA certification, and the first production unit was delivered in May 2025 to a private owner in France. At the same time, the aircraft began gaining more and more popularity, and thanks to a partnership with JB Investments & Aeroclub (the official dealer for Poland), the Integral R made its way to Poland at the end of May. This wasn't a coincidence, but a dedicated showcase event combined with multiple flights and the opportunity to get to know the aircraft up close in Konstancin-Jeziorna, near Warsaw.

On site, I meet with Bastien and Romain - the Sales Director and Demonstration Pilot, respectively, with whom I soon spend a few days in a very pleasant, aviation-filled atmosphere. The Integral R awaits us in front of the hangar, painted in a unique light grey livery and bearing the registration F-WIAR. This is a prototype used for certification and various flight tests. The aircraft has already clocked several hundred flight hours, yet it still looks brand new. The fuselage is sleek and aerodynamic, and on the wings, fuselage and tailplane, you can spot a pattern of small painted triangles. "Painting just that pattern took about three weeks. For our clients, we offer a few standard paint schemes, but we can also prepare custom designs," explains Bastien.

Versions R, S, and E

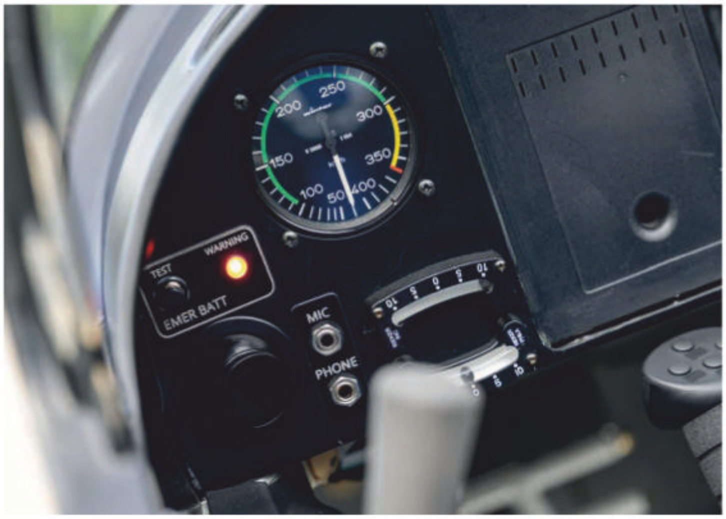
Before we take a closer look at this particular aircraft, we have to wait a bit for better weather, a perfect time for a much-needed coffee and a chat. Soon enough, many questions start popping up around the aircraft, and the team from France is more than happy to answer them. The version that came to Poland is the certified "R" model (short for Racing), featuring a tailwheel configuration, as befits a true aerobatic aircraft.

Aura Aero is well aware that tail-wheel aircraft come with certain limitations and are slightly more demanding for the pilot. That's why a second version, the "S" model, is also in the process of certification. It features a slightly less powerful engine (180 hp vs. 210 hp), but comes with a nose-wheel, aiming to eventually achieve full IFR certification. This makes it an ideal solution for advanced training, while still being capable of performing basic aerobatic manoeuvres.

The third variant is the "E" version, standing for electric. The aircraft structure is very similar to the S model, but its propulsion system is fully electric. The current maximum flight time is 45 minutes, with a future goal of reaching 90 minutes. "This aircraft is our answer to environmental concerns, but also the essence of innovation. We've already completed the first flights, including aerobatic ones, and it behaves very similarly to the combustion version - outperforming it in some aspects, such as climb rate," says Romain.

Wood and Carbon

The designers of the Integral R opted for a classic and robust



LEFT TO RIGHT: The airspeed indicator is calibrated in kilometers per hour, which provides greater precision for aerobatic flying.

The Garmin G3X serves as the main avionics suite. In front of the pilot is space for either an iPad or an aerobatic sequence card.

The seats are comfortable and secured with five-point Hooker Harness seatbelts. If you're shorter, a cushion might be useful.

construction, primarily based on wood, reinforced with carbon fibre, all bonded with a special adhesive to enhance durability. Both the fuselage and wings are mainly wooden, while the control surfaces are predominantly made of carbon fibre. Notably, the ailerons lack the usual counterweights underneath to improve left/right stick responsiveness, yet full deflection control remains completely effortless.

As expected of a tailwheel aerobatic aircraft, the Integral R has no flaps. The tailwheel is additionally reinforced and built with a sturdy steel structure to ensure safe operation from grass airfields. One interesting design detail is the fused construction of the front canopy section with the engine cowling - this prevents it from tearing off and ensures the aerodynamic flow around the aircraft remains uninterrupted. It's one of several thoughtful improvements over other aircraft in its category.

What about maintenance for such a machine? Bastien offers some clarity: "In fact, it's no different than any other aircraft. It can be maintained by properly certified Part-145 organisations familiar with working on wood and composite structures. The engine is a standard Lycoming, and the avionics are from Garmin and Trig - both widely used brands. Additionally, we have a team of mechanics who can quickly reach any location in Europe in case of urgent issues."

Safety and comfort

Before stepping into the cockpit, my attention is caught by the aircraft's installed parachute system. "This is the first aerobatic aircraft equipped with a built-in ballistic recovery system. It's a really capable setup that can save the aircraft even when deployed during inverted flight or in a spin," explains test pilot Romain.

> “This is the first aerobatic aircraft equipped with a built-in ballistic recovery system.”

The cockpit is fairly minimalistic, yet well-equipped. In the centre sits a Garmin G3X avionics suite. On the right side, you'll find a discreetly mounted Trig radio and transponder, along with the circuit breakers. On the left, there's an analog airspeed indicator and altimeter. Directly in front of the pilot, there's no traditional six-pack layout; the avionics are centrally located instead, leaving space for mounting an iPad or aerobatic sequence card, both of which are far more practical for this type of flying.

The seats are comfortable, though your legs are stretched out straight in front of you; it's not a typical chair-like sitting position. Even so, rudder pedal access is easy, and they're adjustable. You're strapped in with a five-point Hooker Harness. The central panel with the throttle, propeller and mixture levers effectively separates the space between pilot and passenger without feeling cramped. Interesting fact: the Integral R's cockpit is 20 cm wider than that of the Cap-10, a notable difference.

As I mentioned earlier, F-WIAR is a prototype and test aircraft. That explains the additional instrumentation visible above the cowling, used to measure structural vibrations, and also - interestingly enough - a brass knuckle. It's carried by test pilots for emergency use, allowing them to break out of the canopy if necessary.

Speaking of the canopy, it opens rearward using additional actuators and has a centrally located high-visibility handle that clearly indicates whether it's fully locked or open. Currently, the canopy must be fully closed before engine start, but Aura Aero engineers are working on a certified solution that would allow for partial ventilation during taxiing.

The Integral R visited Poland at the end of May, stopping by JB Aviation & Aeroclub headquarters.

Who and why?

In conversation with Bastien, I ask about the target audience for this aircraft and its market competitors. "When we talk about aerobatic aircraft, everyone immediately thinks of the Extra - and for good reason. It's an excellent aircraft for advanced aerobatics. But frankly, it's too fast and too agile to learn basic maneouvres on, and it's too expensive to be a realistic training platform for UPRT students. That's exactly where the Integral R fits perfectly.

"In designing this aircraft, we gathered a lot of input and requirements from aerobatic pilots, flight instructors, and flight schools. At the same time, we wanted to create a better design overall—one that solves the shortcomings of competitors like the Cap 10, and delivers an aircraft that's not only fun to fly, but also highly suitable for training."

The Integral R isn't meant for unlimited or even advanced level competition aerobatics; it's certified to ±7.5 G, but it's perfectly tailored to teaching foundational aerobatic skills in a safe and structured way. Students are given the chance to truly understand how to properly execute each figure without being overwhelmed.

Another key role for the aircraft is in Advanced Upset Prevention and Recovery Training (UPRT). This training requires pilots to recover from unusual attitudes and spins, and the Integral R is exceptionally well-designed for that mission, offering predictable behaviour and forgiving characteristics.

And let's not forget private owners. After all, who wouldn't want an aircraft that cruises at 150 knots, has a spacious and comfortable cabin, and can also perform aerobatics just for the sheer joy of flying? The answer is obvious.

Let's fly

Conversations are one thing, but what everyone is really waiting for is the afternoon flight, the moment to see what the Integral R can do in the air. I put on on the parachute and join Romain in the cockpit. Getting in and out of the aircraft is surprisingly easy thanks to a wide step, wide non-slip wing surface, and a dedicated handhold just behind the canopy.

Romain closes the canopy, we pump fuel to the engine, and start up smoothly. "Cold starts are very easy and pleasant in this aircraft," he explains, "but hot starts can sometimes surprise the pilot."

We taxi out to the runway, and I immediately notice how quiet and refined the engine sounds; it's almost artificial. That's because the Integral R uses an electronic ignition system rather than traditional magnetos. It's a relatively new technology, but one that significantly reduces engine

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Specifications

Wingspan	8.78m
Length	7.26m
Height	2.48m
MTOW	1005kg
Fuel capacity	159l
Powerplant	Lycoming AEIO-390/A3B6, 210 KM
Propeller	2-bladed, MTV-15-B-C/C193-25
Design speed Va	162 KIAS
Stall speed	60 KIAS
Range	980km
Aerobatic certification	+7.5/-7.gG
Manufacturer	Aura Aero (France)

TOP TO BOTTOM: The aircraft feels very stable in flight and requires only light control inputs.

The Polish-French crew – (from left) Romain Coeur, Jakub Śliwiński, and Bastien Sclafer.

IMAGES: FILIP MODRZEJEWSKI

noise, both on the ground and in the air, making this plane much quieter than its competitors.

After the engine run-up, we begin our takeoff roll. At around 120 km/h we lift off the ground effortlessly. Sharp turns in the traffic pattern are no problem for this machine, and our climb rate consistently stays above 1,000 feet per minute. We wave to the spectators at Konstancin Airfield, then head southeast.

I take the controls and fly straight and level to get a feel for the aircraft's behaviour. It's very stable in flight: let go of the stick, and the aircraft keeps going just as you left it. At the same time, when I bank or manoeuvre, the response is smooth and direct, requiring no significant effort.

I'll admit: it's been a while since I've flown something with this perfect blend of stability and agility.

In a cruise, we maintain a steady 270 km/h, which is the typical cruise speed for the Integral R. One interesting detail: the airspeed indicators are calibrated in kilometres per hour. "The main reason is precision," Romain explains. "Kilometres per hour offer much finer granularity than knots, which is especially useful in aerobatics." Of course, each owner can set their preferred units on the Garmin G3X.

Time for aerobatics

During cross-country flying or circuits, the Integral R behaves beautifully. It's been a long time since I've experienced this level of pure enjoyment from hand-flying an aircraft. But now, it's time to bring an even bigger smile to my face: aerobatics. Especially fitting, as I recently brushed up on my skills in a German-made Grob Aircraft.

We begin with a barrel roll, followed by inverted flight, where Romain shows me the correct pitch attitude - significantly higher than in normal straight-and-level flight. We go on to perform a few loops and Cuban eights, and with each maneouvre, I find myself falling more in love with this aircraft. The 210-horsepower engine offers generous energy reserves, allowing us to perform loops between 210 and 300 km/h, without needing to dive for speed.

Executing aerobatic manoeuvres in the Integral R is a true pleasure. The aircraft responds directly and precisely to control inputs, and each figure is performed smoothly and predictably. What's more, the pace isn't excessively fast, unlike in some other aerobatic machines, giving both the pilot and any potential student time to understand the manoeuvre and refine their technique. The aircraft has a roll rate of 180 degrees per second, which means it can complete a full roll in just two seconds.

> **"I'll admit: it's been a while since I've flown something with this perfect blend of stability and agility."**

Another nice touch is the ability to disable the electric trim system via a switch in front of the pilot, preventing any unintended inputs during aerobatics. Before heading back, we perform a couple of spins to test how the aircraft handles such situations, and once again, it passes with flying colours. Even after several rotations, recovery is quick and effortless.

We're flying back to Konstancin, following the Vistula River back toward the airfield. The landing procedure is straightforward: slow down to 145 km/h, turn on the lights and fuel pump, then descend in a gentle slip for better runway visibility, and touch down in a classic three-point landing. This flight proved to me just how well-designed and well-thought-out this aircraft truly is. I have no doubt the Integral R will become a popular choice for aerobatic schools and private pilots across Europe and the U.S.

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Ride-share in the Air

Success in aviation comes from creating a niche and then owning it. Entrepreneur pilot Stephen Boyd, and the team at Diamond Air Taxis (DAT) are doing just that. **Paul Southwick** takes a closer look with a flight in one of their DA62 aircraft.

MAIN IMAGE: AT's mission is "to make private air travel easy, flexible, and affordable.

LEFT: Boyd & his DA62

DAT's mission is "to make private air travel easy, flexible, and affordable. Whether planning a special lunch in Mudgee, a business trip to Canberra, or a once-in-a-lifetime gift for a loved one, DAT offers a seamless and unique travel experience that redefines the convenience of flying. Just type in your dates and destination, find a flight time that works for you, and leave the rest to us. It's like ordering a taxi for the air, booked from the comfort of your couch."

How it works

At the core of DAT is a proprietary booking system, commissioned and under continual improvement by Boyd. It streamlines private air travel, allowing customers to effortlessly choose departure and arrival locations, specify passenger and baggage details, and request a return trip. The system checks weather conditions for safe take-off and landings, verifies aircraft and pilot availability, and calculates flight duration and fuel requirements, all in milliseconds. Customers can then select an available departure time, including discounted options for same-day, short-stay or empty-leg flights.

There is a generous cancellation policy encouraging forward bookings. If customers cancel with more than seven days' notice, they receive a 100% refund; more than 48 hours but less than 7 day notice gives a 75% refund, and less than 48 hours prior to the flight date or a "no show," customers still receive a 50% refund.

Founder's background

Boyd has had a passion for aviation for as long as he can remember. He says, "I was one of those kids, going to air shows and watching planes. I wanted to be an airline or Air Force pilot. I just wanted to fly." As a teenager, Boyd balanced delivering pizzas with funding flying lessons. "I self-funded everything."

When he found out he couldn't fly with the Air Force, because he wore glasses, Boyd pursued an engineering career. His technical aptitude led him to join the Air Force. "I didn't work on aircraft directly, but I was an engineering officer in the Air Force." Boyd's academic journey solidified his technical expertise. "My degree was in computer systems engineering, and my PhD was in systems engineering," he says. Post Air Force, Boyd started an engineering business in the transportation sector, with his wife Alia, which grew to 150 employees, before selling it.

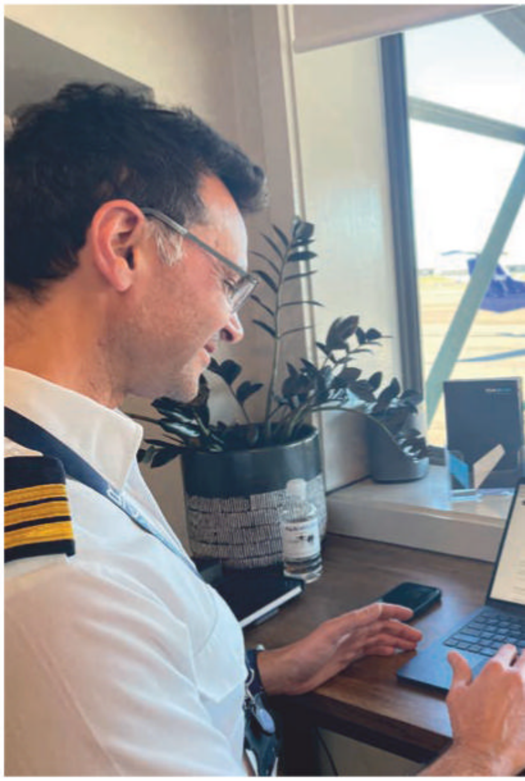
Boyd then returned to his first love: flying. He bought a small plane and immersed himself in aviation, which inspired him to innovate within the charter aviation sector. More recently, Boyd, after doing the type rating at Flight Safety in the UK, and extensive training with Navair in Sydney (through which DAT operates its services) has qualified as pilot in command on the Cessna Citation Mustang, which he also flies as part of the service. Boyd now has his eye on a Cessna CJ3 rating - an aircraft which could eventually extend DAT's range to New Zealand and beyond. Says Boyd, "I enjoy the constant challenge of taking on more complex and interesting things in aviation."

Boyd flew his DA62 to Australia from the Austrian factory, with ferry pilot, and grade one instructor, Stuart Caling. That took seven days, with a ferry tank in the back, facilitating 2,000 nm legs.

Catch a cab in the clouds

The idea for DAT struck Boyd while he was booking a rideshare. "I thought, there's really nothing where you can just book an aircraft to go from Sydney to somewhere, like you book an Uber." The ease of booking a ride with just a few taps on his phone sparked his imagination.

Boyd envisioned a similar seamless booking experience for charter flights. "Wouldn't it be way better if this was the way you book, like an airline, but it's not an airline flight?" The existing process for chartering planes was disjointed, cumbersome, and different everywhere. "The problem was that the way charter



flights worked was that you had to find a company, fill in a form with your details, and wait for them to get back to you, not knowing the price."

"It occurred to me when I was booking an Uber, how nice the process was. You simply open the app, choose the best option, pay up and go. There's nothing more to do."

Boyd decided to create a streamlined booking system for charter flights. The end result is a platform that makes private air travel nearly as simple as booking a ride with Uber. This innovative approach not only makes it easier for customers to find and book charter flights but also helps operators optimise their fleet utilisation and reach a broader audience.

Aircraft choice

DAT is a booking agent that partners with commercial air transport operators. Its list of partner operators continues to grow. Currently they have three DA62s and four Citation Mustang jets online. This will continue to expand.

The DA62 has a large cabin with a 60/40 split-folding second-row of three seats, and a third row of two smaller seats, providing space for up to seven people. The engines are quiet, and the noise is even further reduced with Bose noise cancelling headsets supplied for every occupant. The interior includes leather seats, large windows, LED lighting, USB-A and USB-C charging ports, heating, and air conditioning, ensuring a comfortable and luxurious journey from start up to shut down.

> **"It occurred to me when I was booking an Uber, how nice the process was. You simply open the app, choose the best option, pay up and go. There's nothing more to do."**

Diamond Aircraft has an industry-leading safety record, achieved through a comprehensive range of active and passive safety features. The DA62's advanced avionics, structural integrity, and system redundancies, including twin engines, provide the highest level of protection for passengers. With features like weather radar, including turbulence detection, satellite weather datalink, traffic advisory system, TKS de-icing, onboard oxygen, unparalleled visibility, positive stability, and robust crashworthiness, the DA62 is selling well (64 were delivered world-wide in 2024).

The DA62 excels in performance and efficiency, moving passengers and equipment farther and faster than any other aircraft in its class. At ten to twelve thousand feet, speeds of 180-190 knots are possible. The aircraft has flight into known icing (FIKI) too, essential in NSW, VIC and TAS winters. It's 180 hp diesel engines consume about half the fuel of gasoline piston engines for around the same performance. Additionally, they burn Jet-A1, which is lead-free, cheaper, and produces less CO2 emissions than traditional engines.

Says Boyd, "Almost every 'new to flying' passenger says how much smoother, quieter, and more comfortable the DA62 is than they expected. We recently added Starlink which provides high speed internet, even in the outback, where there is no mobile coverage. This means that many of our business or medical team passengers can work on their devices during their flights."

The Citation Mustang delivers twin jet performance in an efficient package with a cruise speed of 340 knots, and a range of over 1,100 nautical miles. Its Pratt & Whitney turbofan engines offer reliable power while keeping operating costs low, making it one of the most economical and popular light jets in Australia,

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LEFT TO RIGHT:
Gull wing door make entry easy.
Boyd checking the booking system with VHX62 in the background.
The DA62 boasts built in checklists.
The advert launch campaign.

with a reputation for being safe and easy to fly. With the ability to land at regional airports across Australia, this aircraft allows access to places with shorter runways less served by airlines.

An example of the Mustang, VH-IEQ, was in the Navair hangar when we visited. It looked magnificent and brand new, with its shiny, black and silver colour scheme, complimented by a luxurious black leather interior. The three large screen Garmin cockpit is an example of ergonomic excellence.

Promotion

DAT promotes itself via a number of channels, including LinkedIn, billboards around Sydney, letterbox drops in high income suburbs, and via Boyd's YouTube vlogs, which he says attract a surprising amount of attention, driving word of mouth enquiries, as do existing customers. Boyd says that the twin engine nature of the fleet has been a big plus, with a surprising number of customers (or their staff) saying that they are not at all comfortable in a single engine aircraft over mountains, remote territory, or at night. After trying 30–40-year-old legacy twins, once they've experienced the DAT fleet, they then only want to fly with DAT in its modern twin aircraft.

As well as charter, DAT offers scenic flights. The website has been very well thought out with lots of easy-to-read information for customers. For example, Q&As about destinations, safety, comfort, children and infants, luggage, pets, noise, weather, turbulence, diversions, temperature, parking and directions.

In terms of safety and weather, Boyd says DAT purposely does not accept flight bookings into airports that have marginal weather conditions, such as low cloud ceilings, low visibility or strong gusty winds forecast. "It is important that customers have a good experience and come and fly with us again," he says.

Customer profiles

Boyd says there is a wide range of regular customers, from diverse backgrounds, but more common are: medical and allied health workers or government agencies wanting return daily trips to regional or remote areas; business people needing to get to places quicker and more conveniently than the airlines can, or don't service at all; groups of friends planning away trips or holidays together; and sport or cultural event based customers.

Free onsite parking, and easy access to Navair facilities at airports are also a big attraction.

Let's go flying

As Boyd contracts himself, as a commercial pilot, and his plane, to DAT, via operator Navair, under their AOC and checking systems, it was possible to go for a fly with him in his DA62, with the apt registration, VH-X62, from the Navair base at Bankstown airport. Boyd says some controllers know his registration and say that they watch his YouTube channel.

X62, in a deep, bright blue colour scheme, was in immaculate condition. The huge, high lifting gull wing doors, front and back, make passenger egress easy. X62 is maintained at Port Macquarie by Australian International Aviation College (AIAC), which also provides flight training for airline pilots, flight instructors and corporate pilots, using a Diamond fleet of aircraft. Says Boyd, "They are expert in Diamond aircraft and their engines. Most importantly, I can count on them to complete scheduled maintenance to an agreed timetable. This is critical when the aircraft is a revenue earning asset, and any downtime would be costly."

I flew the DA62 from the left seat when it was first released in Australia and was impressed. Australians are famously conservative when it comes to new aircraft, and it took several years for it to catch on. However, as legacy twins continue to age, with increasing downtime, maintenance and parts supply issues, and accidents or incidents, it was to be expected that a modern, safe and efficient DA62 would start to sell, based not just on its appeal to pilots and accountants, but passengers as well.

Boyd says that because of the confidence the DA62 engenders in safety and fun, a lot of customers ask to sit up front with the pilot, to observe things and enjoy the experience. I took the front right seat too. Impressive was the width of the cabin, front and back.

Before flying, we did a careful preflight together. After our flight a Navair pilot under supervision was heading out on a charter. It was reassuring to see another thorough preflight conducted. Ours was to be a local flight up and down the lane of entry with a circle around the Barrenjoey Lighthouse.

From instant engine start, through automatic run ups, and smooth flight, the DA62 impressed in every way. The built in checklists were used by Boyd for every phase of flight, and a professional pre-take-off safety and emergency brief conducted. Take off was relatively quick and rate of climb excellent. There was none of the screaming engine sound typical of legacy twins. This is not a light aircraft though, and flies more like a medium twin, with firm controls.

The avionics provided great situational awareness, both navigation wise and of other traffic as we returned way too soon via Prospect Reservoir. As well as being a high-speed cruiser, the DA62 handling was docile with easy control during slow flight and landing. It is difficult to think of another aircraft more suited to the air taxi role in Australia.

Lessons from the USA

When it comes to air taxi services, many have come, many have failed. In the large US market, Verijet (the most prominent player), established in Miami, attempted, albeit with a different, subscription-based model, to set up an air taxi business using Cirrus Vision Jets. They have services in the southeast, plus California, New York and Texas. The founders stated their vision was, "the culmination of a decades-long journey to increase the effective speed of door-to-door travel, reduce carbon and noise footprint, and open private aviation to more people – unlocking the fourth wave of high-speed travel, to be the safest, most efficient airline on and for the planet" and "to redefine travel by offering a one-of-a-kind experience that eliminates the hassle of crowded airports and lengthy security lines. With a focus on safety, sustainability, luxury, and efficiency, Verijet raises the bar for unparalleled travel."

Verijet was ultimately unsuccessful, facing multiple lawsuits and now operates with a reduced fleet of just a few jets, down from more than 20.

Much of the future talk relating to air taxi services revolves around electric vertical take-off and landing (eVTOL) aircraft for short to medium-range flights, usually within or between cities that are close. A lot of work and a lot of money is going into eVTOL development, but that's another story, for another time.

Expansion plans

Australia and DAT are very different from the set up in the US, but lessons can be learned from other markets. Boyd is the first to admit it is early days for the DAT service. In business, especially aviation, sometimes it is best to be a follower, learning the lessons of the pioneers like Verijet. Uber certainly learnt from the serious mistakes of the taxi industry.

Boyd has developed a well thought out customer focussed, solution for Australia, backed by an impressive, ever improving proprietary, hard to copy, booking and scheduling system. He is proceeding cautiously. Being the owner of the business, commercial pilot, aircraft owner, and operator himself, he understands all the components, as well as the need for the model to work for all players.

Currently DAT operate charter flights to more than 150 destinations across NSW, VIC, SA, QLD, and ACT, with operators in multiple locations, each with their own DA62 aircraft and professional pilots. Boyd would like to see multi aircraft operators in WA too. He says as more operators and locations are added, the better the business model works to increase aircraft utilisation, reduce aircraft repositioning, and improve profitability for all involved.

For more information on DAT, search: www.diamondairtaxis.com

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Products & innovation

Lightspeed Zulu 4

A new aviation headset is one of the most thoughtful Christmas gifts a pilot could receive, second only to a brand-new aeroplane. Lightspeed Aviation has unveiled its latest creation: the Zulu 4 headset. This innovative headset exemplifies the rapid advancement of technology and artificial intelligence in aviation, with each new model surpassing its predecessors and outshining competitors in features and capabilities.

Founded in 1996, Lightspeed launched its first active noise reduction headset at Oshkosh (AirVenture) that same year. Since then the company has continuously evolved its product line, introducing the Zulu model with Bluetooth in 2007.

The Zulu 4, elegantly designed in black and silver, was released at Oshkosh 2025 and is now available in Australia. It boasts three significant advancements that are sure to impress pilots. First, the new ear seals are a "prayer answered" for those who wear glasses or sunglasses while using an over-the-ear headset. The tapered foam design of the ear cups is engineered to create a better seal around headwear, minimising pressure points, enhancing performance and maximising comfort. The ear cups fully enclose the ears, preventing discomfort and potential headaches caused by excessive pressure. Moreover, the low-profile, stainless steel headband conforms closely to the head, resulting in improved weight distribution and reduced pressure, perfect for pilots who wear a headset for long periods.

Secondly, the Zulu 4 features enhanced upstream audio, which provides up to a 90% reduction in background noise during outgoing transmissions via Bluetooth. This functionality improves clarity when making calls in-flight or communicating with Air Traffic Control on the ground. Advanced microphone technology further aids in noise cancellation, while a user-adjustable mic gain allows for seamless balancing of voices. Lightspeed's stereo cross-feed technology delivers pristine audio quality and exceptional music fidelity.

Lastly, the Zulu 4 introduces enhanced flexibility. One standout feature is its ability to connect to two devices simultaneously through "Dual Bluetooth." This allows pilots to connect both their tablet and mobile phone at the same time, streamlining communication and access to information. Additionally, a 10% longer microphone boom and an extended upper cable facilitate optimal headset positioning, ensuring comfort and convenience.

The Lightspeed Zulu 4 is also compatible with the Lightspeed Aviation App, a complimentary in-flight cockpit recording application available for Apple iPad and iPhone. The Zulu 4 is offered in various configurations, including a dual GA plug, 6-pin Lemo plug, or U-174 Helicopter plug version.

In line with their commitment to the Australian aviation community, Lightspeed has generously provided Australian Flying with one of their new Zulu 4 headsets for testing across multiple aircraft, with a detailed report to follow in an upcoming edition.

Price: $1,899.00

For more information:
www.lightspeedaviation.com/

iPad Mini 6 / 7 Cooling Case (with pencil holder)

It's great when tech works but sometimes it need a bit more support (like when your iPad shuts down due to overheating). Wombat Ware has designed an iPad cooling case that will fit your everyday use of the iPad and especially when you need it most - like for your EFB, drone flying and while working in warmer conditions.

The iPad Cooling Case will keep your iPad several degrees cooler using quiet blower fans, preventing it from a thermal shutdown when it gets too hot.

It fits the iPad Mini 6 / 7 snugly (pictured) and provides some basic level of protection, especially at the corners. The cooling case allows access to its key functionalities (Camera, Touch ID and sleep button, volume buttons, speakers), AND it supports the Apple Pencil 2 (or Apple Pencil Pro for the iPad Mini 7).

Other models are available on the website.

Price: $319.00

For more information:
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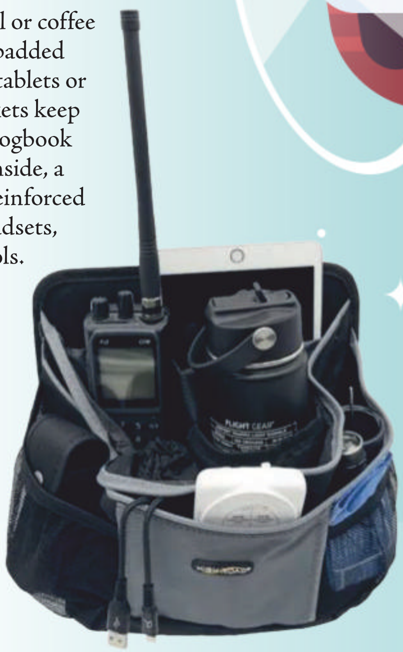

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Lessons from a logbook

JIM DAVIS

Jim Davis has a passion for instructing. He has been training civil and military pilots, in the air and on the ground for 50 years. His other passion is writing, which he studied at Curtin University in Perth. You can see, and buy, his two pilot text books PPL and Flight Tests at www.jimdavis.com.au

Fuel Systems – why so complicated?

You know those aggranoying people who say, "Oh I wouldn't fly in one of those little things – you can't just pull over and fix it if something goes wrong"? What makes this particularly irritating is that the bastards are right. ***Jim Davis*** *explains why.*

Pupes, pilots and instructors, lend me your ears. By far the most common reason for aeroplanes to 'break down' is because the pilots don't understand the fuel system. There are at least twenty things that you have to know about your aircraft's plumbing if you plan on a long and healthy future in aviation. I'll tell you about them in a moment.

Now, let's see how that compares with a car which has just three things that are nice to know:

- which side the filler is on
- how to open it while sitting in the car
- it's still got some gas after it shows 'E'

If you don't get these things right in your car, the worst that can happen is that you have an unplanned stop while you phone the rescue people. You really don't have to understand cars, or your watch, because they just keep working despite your ignorance.

But aeroplanes are not that easy. They DO give trouble, and phoning the NRMA won't increase your life expectancy. So let's look at those 20 things you need to understand in order to avoid a worrying silence ahead of the firewall.

1 Fuel gauge

These are NEVER to be trusted. The problem is that wing tanks are often of such a shape that it's not possible to make gauges that tell the truth under all circumstances. We discussed this at length last time.

2 Fuel pressure gauge

This measures the combined pressure of the mechanical pump and the electric pump which both feed the carburettor. The normal pressure is somewhere between about two and seven psi.

Have a look at the diagram on page 53 and try to figure what would happen to the fuel pressure if you accidentally left the fuel low-point drain on. No, I'm not going to tell you; this is all part of understanding and being involved.

A fuel pump is needed on low-wing aircraft to raise the fuel from the tank to the carburettor. Many small, high-wing aircraft don't even have a pump; they rely on gravity to do this job. Don't confuse fuel pressure with fuel flow. We are keeping this simple and just dealing with carburettor engines, not fuel-injected ones that have fuel flow gauges.

However, while we are on the subject, if you are flying a fuel-injected aircraft, fuel flow is absolutely critical. I'll tell you about it in a minute.

3 Ball slip-indicator

Those who were paying attention to previous sermons will remember that the fuel goes where the ball goes. So, if you are sideslipping to the left and you are selected to the left tank, it's possible the engine will starve.

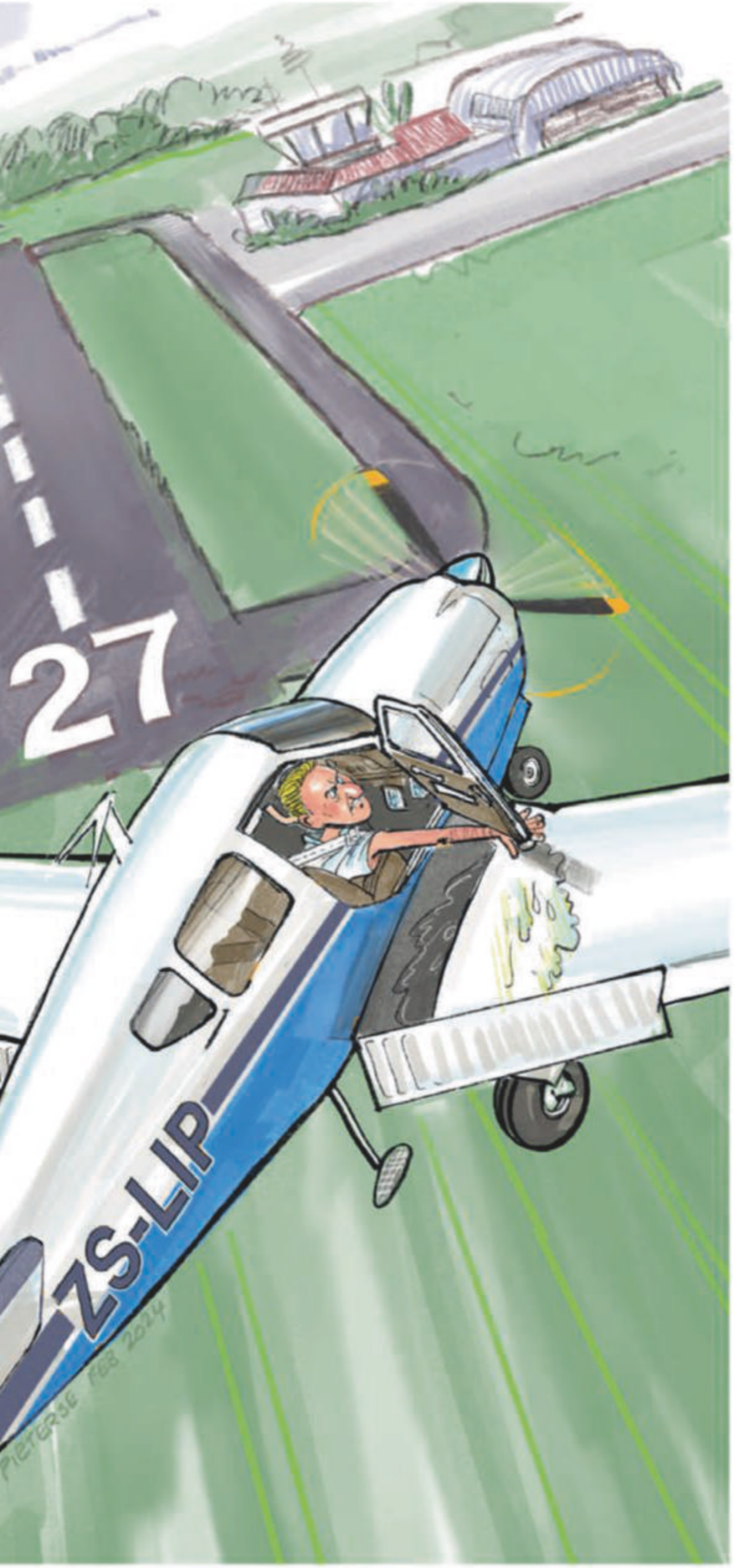
And remember that Madame Beech warns that a rolling takeoff can cause the engine to die. She means if you do a cowboy turn onto the runway – say to the left, in your Bonanza – then the fuel may slosh away from the outlet on the right tank and cause you some despondency during take-off.

4 Electric fuel pump switch

Oh boy, this little goody can kill you in seconds if you get it wrong on take-off or on aircraft propelled by Conti fuel-injection engines. If there is one switch in the whole aeroplane that should be labelled FFS THINK, it's this one.

This isn't the place to go into details of how the fuel-

A pilot's logbook is far more that just a record of dates, times, places and flights; it is also a history of a pilot's flying career and a chronicle of the lessons learnt that makes them the aviator they are today. Jim Davis takes a look back through his own logbooks, and records the incidents that have shaped his approach to flying.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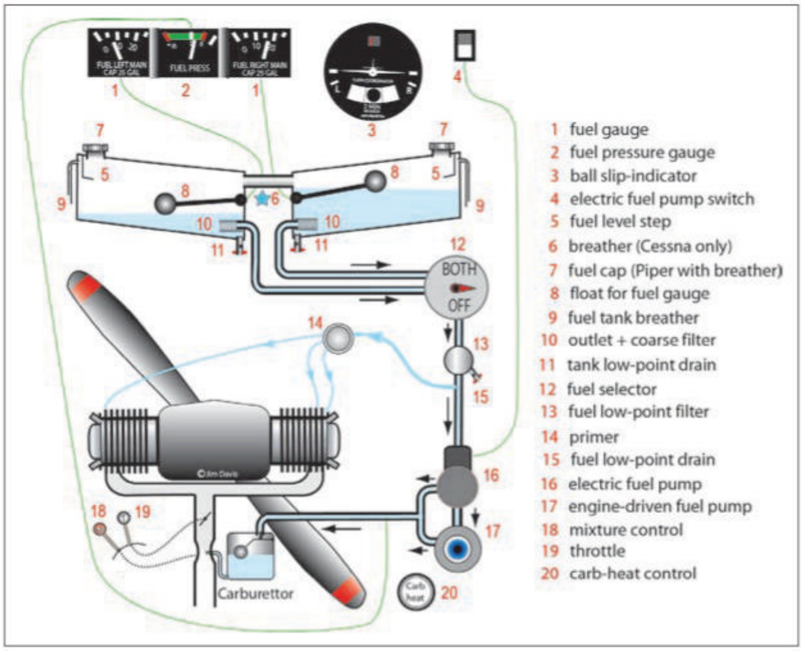

FUEL LEFT MAIN CAP 25 GAL
FUEL PRESS
FUEL RIGHT MAIN CAP 25 GAL
BOTH
OFF
Carburettor
Carb heat
© Jim Davis
1 fuel gauge
2 fuel pressure gauge
3 ball slip-indicator
4 electric fuel pump switch
5 fuel level step
6 breather (Cessna only)
7 fuel cap (Piper with breather)
8 float for fuel gauge
9 fuel tank breather
10 outlet + coarse filter
11 tank low-point drain
12 fuel selector
13 fuel low-point filter
14 primer
15 fuel low-point drain
16 electric fuel pump
17 engine-driven fuel pump
18 mixture control
19 throttle
20 carb-heat control

RIGHT: try to figure what would happen to the fuel pressure if you accidentally left the fuel low-point drain on.

injection system on a six-cylinder Continental engine works, but briefly this is what happens. The electric fuel pump switch has three positions: OFF, Hi and Lo. The Hi position is ONLY used to purge the system of vapour locks. If you use it at any other time the engine will stop. It must NEVER be used on take-off. Don't take my word for it; see what the POH says for your particular aircraft.

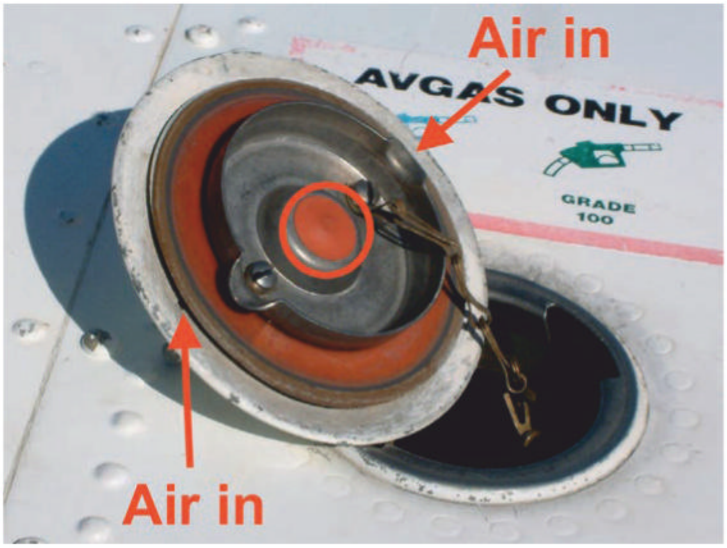
With the six-cylinder, fuel-injected Conti, the pump must be on, but only in the Lo position. I keep seeing accident reports, often fatal ones, where a Bonnie, a C-210 or a Seneca has crashed and burned on takeoff because the pump was selected to the Hi position.

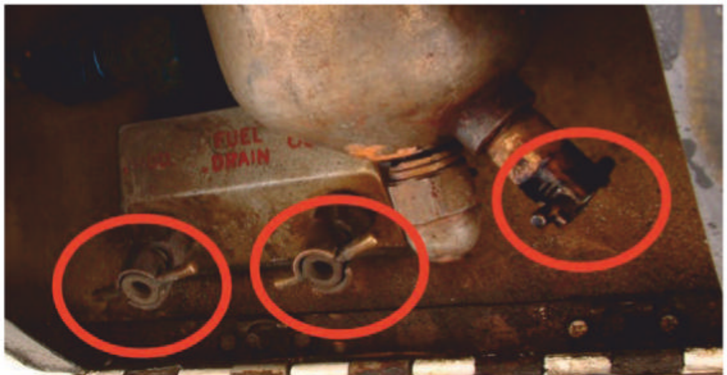
While we are on the subject, it's critical with a fuel-injected engine that you keep a sharp eye on any fluctuations in fuel flow during take-off. The slightest flicker or wander of the needle calls for an immediate abort. Don't assume it's just an air bubble and wait to see what happens. Take it as a warning that all is not well. Finally, a good pilot keeps his finger on the fuel pump switch and watches the pressure, or flow, for a few seconds after switching it off.

5 Fuel level step

Piper has got this dead right, it's a really useful bit of clever design. On the Cherokee range, the main tanks hold 25 US gallons each. If you are on level ground and the fuel is at the step, then you have got 17 gallons which means that the tank is 50 lbs lighter than when full.

To keep it nice and easy, if you tell the fuel guy to fill it to the step, then you know you can carry an extra 100 lbs in the cabin. And if you want your 140 or 180 Cherokee to be in the 'utility' category for training, then the rule of thumb is no rear seat pax, no luggage and the fuel at or below the step. Easy peasy Cherokeesy.





TOP: The Cherokee caps have never given anyone an ounce of trouble and they cause very little inconvenience to the airflow.

MIDDLE: THE Aztec Drains are far from the tanks

INSET: Cessna fuel cap - the right one at last

6 Breather (Cessna only)

In contrast, this little pipe joining the two tanks on the 100 and 200 series Cessnas is about the worst piece of design I have ever seen. It has been directly responsible for hundreds, perhaps even thousands, of Cessnas running out of fuel.

For reasons no one seems to understand, Clive Cessna decided he only wanted one breather, and he put it under the left wing of these aircraft, and connected it to the left tank. Then he put this troublesome pipe across to the right tank so it too could breathe.

The purpose of a breather is to allow air into the tank to replace the fuel as it's used. If the breather gets blocked say by ice, or by a bug making its home in there, then one of two things will happen during the flight. Either the fuel will stop flowing after a while, or the rubber fuel cell (if the tank has one) will collapse and scrunch up into a little ball which will hold about two gallons next time you refuel it.

Mr Cessna's stupid, little pipe not only allows air to flow from one tank to the other, but obviously fuel as well. This has all sorts of consequences, but the main one is that if you get say three hours out of the left tank then you would expect the same out of the right tank. It won't happen; you have probably only got an hour-and-a-half in the right tank because the fuel cross-feeds as you fly.

This is a dangerous, and poorly understood characteristic of the system.

Also, if you fill both tanks in the evening ready for an early departure the next day, they will only stay full as long as you are parked on level ground, and I mean absolutely level. If it's slightly left wing down, then the right tank will cross-feed into the left one and this will overflow through the breather and disappear into the sand or grass without a trace. And the longer it does this, the lighter the right wing becomes, and the more the aircraft will lean to the left.

7 Fuel cap (Piper with breather)

This is a surprisingly complex bit of engineering. It must act as a breather to let air in, but not water, despite being left outside in torrential storms or even flown through TSs. It also has to prevent fuel sloshing out. And it needs to be aerodynamically slippery. Ideally, it's sunk into the top of the wing and has a nice smooth cover over it. But hang on, if water gets past the cover then the cap will soon be submerged by the water filling up in the recess. That's no good, so they put a nice big drain pipe out of the cavity, and we have to make sure that bugs don't build their condos in there.

Clyde Cessna and Victor Roos bumbled around for 50 years trying to design fuel caps that keep the water out, let the air in, and keep the fuel in. They kept producing modified caps that didn't really do the job. Eventually, they said to hell with aerodynamics, and built a big solid thing that looked like it came from the radiator of a 1932 Fordson tractor. This seemed to work so they painted it red to let you know you have got the right one at last.

Sorry to harp on about Piper, but the Cherokee caps have never given anyone an ounce of trouble and they cause very little inconvenience to the airflow. You need to look very, very carefully to see how they work. On the photo, the bottom arrow points at a small, square-section groove that runs above the main gasket and vents into a cavity behind the circular red valve in the centre. This is made from paper-thin, red rubber which lifts slightly to allow air in but easily withstands the pressure of fuel sloshing against it. It never lets water in.

8 Float for fuel gauge

These seldom give trouble and they also seldom give accurate readings. We have discussed this endlessly. The only thing you really need to know is don't trust your life with any aircraft fuel gauge.

9 Fuel tank breather

On your Cessna preflight you will find the breather pipe sticking out below the left wing, just behind the strut. It is bent to face forward into the airflow. And the Cherokees have one under each wing near the tank. It sticks down about 15mm and it is cut off at an angle. It's also a terrible piece of design because it's small, and almost impossible to inspect for bugs.

I wouldn't be surprised to find that many of the Cherokee ones are blocked. Fortunately, the excellent fuel cap breathers save the day.

10 Tank outlet and coarse filter

The position of the outlet determines how much unusable fuel there is in the tank. Obviously any fuel below the level of the outlet is unusable. Why should we want unusable fuel? Actually we don't. If we could be sure that all the stuff at the bottom of the tank was nice clean fuel, then we would really like to use it.

The trouble is that dirt and water are likely to go to the bottom, and we don't want them getting into the system.

The fuel drain is right at the very bottom of the lowest point, so in theory we should be able to get rid of any crud and water by draining it there. But that's not always the case. We'll discuss that next.

The coarse filter prevents any large objects (like coins or nuts and bolts, which you might accidentally drop into the tank) from blocking the outlet pipe.

11 Tank low-point drain

This should be easy: you drain a bit into your little transparent goodie, make sure it has no water or sediment in the bottom, check it's the right colour for avgas (light blue), confirm it smells like avgas, and dispose of the sample. You do this either by pouring it back in the tank, or chucking it on the concrete where it will evaporate.

> « If there is one switch in the whole aeroplane that should be labelled FFS THINK, it's this one. »

But what if the tank doesn't really have a low point because the aircraft is parked one wing low? Or because it's parked nose down, or has a soft nose oleo? Or because the floor of the tank has slight ripples in it, particularly bladder tanks? All these are common problems – particularly on high-wing aircraft with little dihedral.

On the 100 and 200 series Cessnas, the original one drain point per tank was found to be insufficient. The drains were positioned at the rear end of the inboard sides of the tanks. This was because these aircraft have very slight dihedral and normally sit slightly nose up. So everything is fine as long as you do your preflight on perfectly level ground and the tank has no wrinkles in the bottom which could contain little dams of water.

It took a few years for Clyde and his mates to realise there was a problem, but when they did, they rushed forward with a mod which pretty much sorted it out. They got everyone to fit two, or sometimes three, more drain points per tank. So some Cessnas have eight drain points, which sort out the nose down problem.

But that still left the wing-down and wrinkle problems. At this stage, Clyde Cessna lost it. He hurled his slide rule to the floor in desperation, and sent us all a letter saying, just make sure the wings are level and rock the aircraft from side to side to clear little dams of water. And, if necessary, get someone to hold the tail down so the water goes to the drains at the back. If you didn't get this letter, don't take it personally, but just do as he says.

Now it's Pug Piper's turn to catch it in the neck. Briefly, he caused me to lose both engines in an Aztec five minutes after take-off. When I thought I was draining from the low points on the tanks, I was actually draining the fuel in the pipes that travel from the low points to the remote drains below the engines. There were many gallons of water in all the tanks, it's just that I wasn't draining the them. I was simply draining fuel from the pipes.

Even worse is Piper's stupid system that lets you drain all the tanks from inside the cockpit. It's impossible to see the colour properly through a yellowing plastic pipe. Equally, you can't smell the fuel, or spot water or sediment. This is on the Comanches and Saratogas.

We're just over half way on our 20 points. Tune in next time!

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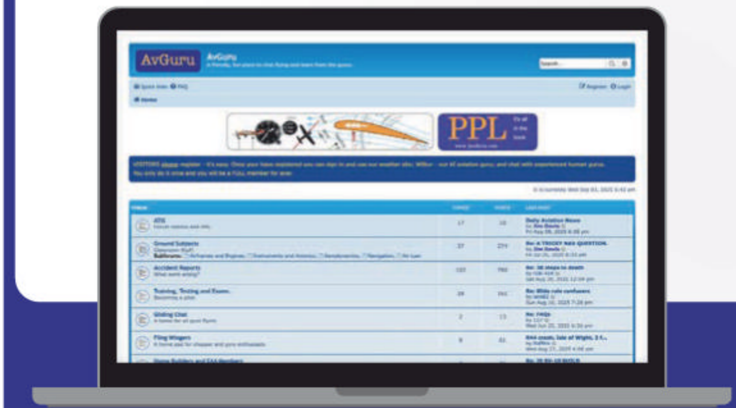

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Jack of All Trades

As far as intermediate single-engine utility helicopters go, it's fair to say the Airbus Helicopters H130 is in a class of its own. **Benn Marks** takes a closer look.

Some surprising facts will reveal that more than 900 of these highly reliable machines have been delivered, and that 467 operators use them globally; also, they've accumulated 3.5 million flight hours (as of at the end of 2024), so it's safe to say a few more hours have been added to that impressive tally since then!

The H130 has, and continues to, offer outstanding performance, reliability, plus a multi-mission capability that's second to none.

Officially classed by Airbus Helicopters (AH) as an "intermediate single-engine helicopter", the H130 can and has availed itself to a multitude of ops since its introduction into service; ranging from tourism / sightseeing, VIP / corporate and standard passenger transport, to HEMS / aeromedical airlift, plus aerial / utility and firefighting work; a comprehensive suite of services in anyone's books.

Being the Jack of all trades helicopter that it is, the H130 certainly has the bulk (and power) to do what it does with what looks like relative ease. Interestingly, despite being classed as an intermediate single-engine helicopter, an observer could be forgiven for mistaking the H130 as a light twin-engine rotary-wing design because of its somewhat largish appearance, but it's not!

An eye-catching design

The distinctive looking chopper certainly garners attention on any helipad with its sleek design. Its bulbous but proportioned-looking fuselage (mounted to tubular skid landing gear) is connected to a solid-looking tail boom with horizontal stabilisers that's rounded out by a très chic, enclosed Fenestron tail rotor, with the machine's efficient, three-bladed, main rotor assembly crowning the design. Translating those details into numerical measurements yields some generous values; the H130's D-value (the maximum overall length of the helo when its rotors are in operation) is 41.47 ft, its main rotor diameter spanning 35.07 ft, while the helo's fuselage stretches out to 35.03 ft. Its accompanying fuselage width and height values being 6.66 ft and 11.84 ft, respectively.

Therefore, for its category, the H130's certainly no lightweight, which becomes immediately apparent when pax step into the cabin. In fact, the cabin alone has a very generous internal volume (excluding the pilot's area) of 130.70 ft^3, allowing for the carriage of up to eight people (one pilot + seven pax); ideal specs for tourism / sightseeing ops, for starters. Proving its credentials in that space alone, and by way of example, the Scenic Group, which operates two ultra-luxury Discovery Yachts, the Scenic Eclipse I & II, both billed as setting the "benchmark in ultra-luxury ocean cruising", operate two H130s each for excursions and experiences around the globe (permits permitting). The helo's smartly designed wide, open-space, full-flat floor cabin is further complemented by having arguably the largest wrap-around windscreen and wide windows in its class, allowing passengers spectacular views of the outside

MONACAIR
AIRBUS HELICOPTERS
3A-MVV
H130

IMAGE: ANTHONY PECCHI

The H130 makes an excellent corporate passenger transport aircraft.

world from their forward-facing seats. And the rear passengers don't miss out either, comfortably seated and slightly elevated as they are (relative to the pax seated immediately in front of them) on a raised theatre-style platform. So, there's certainly (a) room with a view!

> “the H130's spacious and unobstructed cabin is also a perfect fit for life-saving HEMS work”

Spacious cabin

As a further example of its versatility, the H130's spacious and unobstructed cabin is also a perfect fit for life-saving HEMS work; in that capacity the AH machine can be configured to lift one or two pilots, plus one stretchered patient, and up to four pax. Whereas, for something a bit more sedate and VIP'ish in flavour, the helo can be comfortably decked out in a lovely six pax seating config (with one pilot), performing a raft of appealing shuttle or simple charter ops for VIPs seeking a fast and comfortable ride from A to B. That version known as the ACH130 (the “ACH” standing for Airbus Corporate Helicopters).

Regardless, with the H130's exceptionally generous cockpit and cabin glazing, very low internal (and external) sound levels and vibration, thanks to its Active Vibration Control System (AVCS), combined with an efficient air-con system, pax are able to travel in comfort and style in a spacious and comfortable cabin.

Also, if operators are after cabin measurements as a means of comparison against other equivalent sized helicopters, the H130's internal dimensions stack up pretty well. The helo's cabin height alone scales up to 4.20 ft, with its generous width and length values being 6.12 ft and 7.19 ft; specs which definitely assist in eliminating the cramped feeling that passengers sometimes experience when flying in other rotorcraft designs. On that note, the issue of baggage carrying capacity can sometimes raise a degree of irritation for some operators wishing their machines could carry more! Well, the H130 can, with three luggage compartments located on both sides just aft of the pax cabin, with a combined total baggage carrying capacity equating to 365kg; the RH 12.00 ft^3 compartment can hold up to 130kg, the LH 13.77 ft^3 compartment 155kg, while the

IMAGE: ADRIEN DASTE – AIRBUS HELICOPTERS

IMAGE: ERIC RAZ - AIRBUS HELICOPTERS

IMAGE: ERIC RAZ - AIRBUS HELICOPTERS

THIS PAGE TOP TO BOTTOM:
The H130 is equipped with a Safran Helicopter Engines Arriel 2D turboshaft engine

The distinctive looking chopper certainly garners attention on any helipad with its sleek design

The H130 boasts a solid-looking tail boom with horizontal stabilisers that's rounded out by a très chic enclosed Fenestron tail rotor

OPPOSITE: The ACH130 Aston Martin Edition offers a deluxe interior

rear 19.95 ft^3 cargo compartment can hold up to 80kg. Additionally, as an option, the helo can be equipped with two additional cargo pods to augment the volume of both the rear LH and RH cargo compartments, with a STC (Supplemental Type Certificate).

Those specs alone might sound like something out of a marketing fluff piece, but the reality is, the H130 is quite the package. Not surprisingly, the single-engine helo, which was previously known as the Eurocopter EC130 (including the Eurocopter EC130 T2 variant) before Airbus Helicopters rebranded their civil range of helicopters in 2015, is derived from the company's incredibly successful and popular H125 "Écureuil" (or Squirrel) family of light helicopters (formerly known as the Eurocopter AS350 Écureuil). That superb machine having been in service for five decades now. The fine form and lessons learned from that machine were transmitted over to the H130 product line, with the H130's rear anti-torque, highly efficient and quiet Fenestron tail rotor the most noticeable delineator between the two AH machines (the H125 having a 'conventional' two-bladed tail rotor assembly).

Packing the power

The latest iterations of both machines, however, pack hefty amounts of power – the same turboshaft engines, in fact, giving them the capability to do what they do efficiently, safely, and of course, powerfully. In terms of power alone, and ample amounts of it, the H130 is equipped with a Safran Helicopter Engines Arriel 2D turboshaft engine (with Full Authority Digital Engine Control FADEC), which can punch out an impressive 952 shp. Where a powerful lifting platform is required, the H130 can lift a maximum cargo sling load of up to 1,500 kg - roughly equal to its own weight (1,462 kg) – which is an eyebrow-raising spec.

And talking of specs, the rotorcraft's MTOW numbers vary depending on whether the load is carried internally or externally. For example, when the H130's useful load (of 1,038 kg) is carried internally, it's MTOW hits the scales at 2,500 kg, with that (MTOW) figure climbing to 3,050 kg when it's carrying a sling load. Either way, the Arriel 2D turboshaft engine works its magic, in conjunction with the H130's other fine aerodynamic features to provide solid performance and lower operating costs especially when viewed alongside equivalent sized twin-engine machines.

However, before exploring some of the H130's other impressive key systems and specs in more detail, it's perhaps worth noting that a number these highly capable machines operate down under, unsurprisingly. At last count, there were a total of 41 H130s in-service, in country, a figure which includes a lovely ACH130 Aston Martin Edition too; with approximately 20+ H130 operators using them. And consistent with their versatility the machines are used for a variety of ops, ranging from private & business aviation to passenger transport, tourism, aerial and utility work.

So, the AH machine definitely has its admirers, and reverting to some of the helo's key features will further reveal how it does what it was designed to do almost seamlessly. Starting with its flying / lifting capability, the H130 packs a three-bladed main rotor assembly that consists of three composite-material blades (attached to a Starflex head), with an anti-torque shrouded Fenestron (tail rotor) with 10 asymmetrically placed blades, integrated in a vertical fin providing directional control. The Fenestron also assists in providing the H130 with its low noise levels, billed as the quietest in its class, 6dB below the International Civil Aviation Organization (ICAO) limit, as well as enhancing safety by being an enclosed unit (a critical factor especially when operating in confined areas).

Also, being the powerful, smartly designed machine that it is, the H130 can move quite swiftly. On good days when the weather's optimal, the H130 can carry seven pax and fly at a fast cruise speed of 128 kts, providing operators of the type a maximum endurance of up to four hours' flying time (roughly equivalent to flying distances approaching the 332nm-mark).

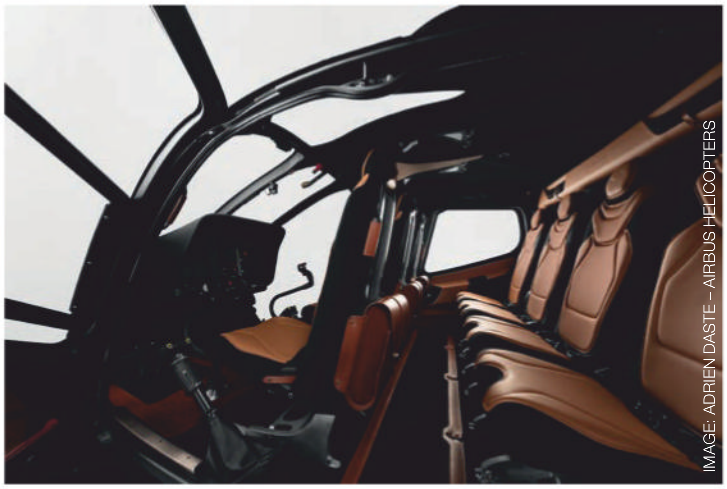
IMAGE: ADRIEN DASTE – AIRBUS HELICOPTERS

While the latest H130 variant – which is certified for single-pilot ops (like all H130 variants preceding it), features the new Garmin G500H TXi glass cockpit featuring a synthetic vision system (SVS), HTAWS (Helicopter Terrain Avoidance and Warning System), plus a sophisticated VFR (Visual Flight Rules) day-and-night navigation system, all of which combined give pilots a real buzz when flying the helo (not to mention extra layers of safety).

Overall, the H130 is a cleverly designed, versatile machine that injects a considerable amount of oomph into the intermediate single-engine helicopter category. And luckily for operators of the helicopter, it appears to hit their sweet spot, too.

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Rotors

***Benn Marks** brings up a round up of rotary news.*

CHC Helicopter Upgrades RAC Rescue Helicopters

Each helicopter is equipped with advanced rescue aeromedical capabilities.

IMAGE: GARTH FITZGERALD

CHC Helicopter recently announced the introduction of three new, upgraded AW139 helicopters, known as RAC Rescue, into service in Western Australia.

Specially modified to deliver all-hazards rescue and advanced aeromedical care, these aircraft represent a significant enhancement to the state's emergency response capability.

Operated by CHC, the RAC Rescue helicopters are funded by the State Government, managed by the Department of Fire and Emergency Services (DFES), and sponsored by RAC. This AUS $26.7 million investment by the WA Government strengthens the state's emergency response capability, delivering faster response times, greater range, and enhanced onboard care for people in need across the state. Capable of reaching speeds of 309 km/h and flying longer distances without refuelling, the new aircraft can respond to more all-hazards incidents and deliver critical care within the vital 'golden hour'. Each helicopter is equipped with advanced rescue aeromedical capabilities, fitted out in Australia by CHC's highly skilled engineers, enabling life-saving treatment to begin in the air.

The operational transition has already taken place, drawing on CHC's decades of global AW139 operational experience. The aircraft replace the Bell 412EPs that have served WA since 2003, during which time the RAC Rescue helicopters have flown over 10,500 missions and more than 2.25 million km.

Cameron Dixon, Head of CHC Australia, said, "These new AW139 helicopters are already changing lives. They give our crews the speed, range and capability to reach people faster and deliver life-saving care exactly where and when it's needed. Whether in a remote community or over open water, we're now better equipped than ever to bring people safely back home to their loved ones.

"We are proud to bring the most advanced emergency response aircraft in the country into service for Western Australia, in partnership with the WA Government and DFES. Our partnership spans more than two decades, and is built on trust, shared expertise, and an unwavering commitment to protecting lives."

The RAC Rescue helicopters operate from Jandakot and Bunbury, crewed 24/7, year-round.

LifeFlight Celebrates Double Award Win

LifeFlight has been recognised for aeromedical excellence after scooping double award wins at the prestigious Australian Aviation Awards, which were recently held in Sydney. The not-for-profit won both the Rotary-wing Business of the Year award and the EMS (Emergency Medical Service) Business of the Year award. The EMS award was the second time LifeFlight has won after taking out the accolade in 2024. The award recognised LifeFlight coming to the aid of more people than ever, with a record 8,477 patients helped in 2024. The Rotary-wing award was given to LifeFlight for extensive work by its helicopter crews, which included clocking up 3,534 missions and airlifting injured motorists, seafarers, hikers and farmers injured by animals among other patients. LifeFlight Chief Operating Officer Lee Schofield, who accepted both awards at a black-tie gala event, said LifeFlight had an exceptional 2024 with unprecedented demand for its services.

"We're humbled to receive these awards which recognises the work our medical teams, pilots, aircrew, engineers and operations staff carry out daily to help people in their time of need," Mr Schofield said.

"As our work grows, we're committed to expanding our capability with new aircraft, facilities and bases to ensure we can continue to offer the highest standards of aeromedical care.

"This recognition is testament to the dedication of all LifeFlight staff who share a vision to provide the best possible care for people no matter where they live, or when they need us."

The Australian Aviation Awards champion the top-performing aviation professionals. The EMS award was the second time LifeFlight has won after taking out the accolade in 2024.

VH-LF4
LifeFlight
RESCUE

LifeFlight won the Rotary-wing Business of the Year award at the Australian Aviation Awards in 2025.

IMAGE: LIFEFLIGHT

John McDermott - Founder and President of McDermott Aviation.

IMAGE: THE COMMS. PEOPLE

McDermott Aviation Responds to Fire Outbreaks in Queensland

The Australian fire season has made its presence felt early, with McDermott Aviation having to deploy two helicopters over the last weekend of August to assist firefighting efforts in Southeast Queensland, as strong winds fanned multiple blazes across the state. Despite widespread rainfall earlier in the year, which encouraged vegetation growth and fuel load on the ground, communities are now facing hot, dry conditions that provide ideal conditions for bushfires to take hold. John McDermott, Founder and President of McDermott Aviation, said while there is no official start date to the Australian fire season, conditions are emerging earlier every year.

"We are increasingly seeing the start and finish of fire seasons blurring - in both Europe and Australia," said McDermott.

"In Greece, fires are starting earlier and burning longer, and we're seeing the same trend here at home. That means our teams have to be on the ready year-round, with our helicopters and crews mobilised at a moment's notice."

McDermott Aviation currently has 15 helicopters stationed in Greece, where teams remain active fighting major forest fires across the country. A number of these aircraft will return to Australia as the European season slows, boosting local capability as conditions intensify.

"Bushfires don't wait for dates in a calendar. We stand ready wherever and whenever we're needed - whether that's in Greece, across Europe, or here in our own backyard," added McDermott.

McDermott Aviation, headquartered on Queensland's Sunshine Coast, operates the Southern Hemisphere's largest privately owned helicopter fleet, with more than 50 aircraft, including the world's largest collection of Bell 214 series helicopters.

While there is no official start date to the Australian fire season, conditions are emerging earlier every year.

IMAGE: GULFSTREAM

Business Aviation Market Resilient

The global business aviation market has continued to demonstrate modest growth and year-on-year improvement, despite a backdrop of uncertainty arising from US tariffs and geopolitical tensions. ***Jessica Graham*** *explores.*

In their recent 2025 Q2 report, ABAA member, Global Jet Capital, reported strong year-to-date performance, underscoring the continued expansion of the business aviation user base over the past five years. The OEM backlog grew by over 8 per cent, with a book-to-bill ratio nearing 1:1 and lead times for new deliveries sitting at between 18 and 24 months.

The Australian market seems to be aligned with global trends, with the demand for long-range business jets continuing to drive new acquisitions and fleet renewal this year and into 2026-27. As this pattern of modest but steady growth persists, we should see this supporting ongoing strong demand for business jet pilots, engineers, and other professionals in the business aviation sector.

Gulfstream Completes First Delivery of G800, the World's Longest Range Business Aircraft

Gulfstream has officially completed the first customer delivery of its ultra-long-range G800, following the FAA and EASA type certifications it was awarded earlier this year. The handover marks a significant milestone, and the company is targeting 13 deliveries by year's end.

The G800's specifications surpass those of its predecessors', boasting a certified maximum range of 8,200 nm at Mach 0.85 and an impressive 7,000 nm at Mach 0.90, positioning it at the forefront of the ultra-long-range market. The aircraft features high-efficiency, Rolls-Royce Pearl 700 engines and advanced wing/winglet aerodynamics for superior fuel economy and performance flexibility. The cabin is configured for maximum comfort with up to four living areas, the lowest cabin altitude in its class, 100 % fresh air passing through a plasma-ionisation purification system and 16 of the OEM's signature panoramic oval windows.

In the cockpit, the Symmetry Flight Deck sets a new benchmark, blending safety, efficiency and pilot ergonomics. Central to the design are active control sidesticks, electronically linked to provide tactile feedback and prevent conflicting inputs, enhancing crew coordination during critical phases of flight. A suite of 10 integrated touchscreen displays reduces reliance on physical switches, streamlines workflows and adapts information by phase of flight, significantly lowering workload and shortening startup times.

Dual head-up displays incorporate the Combined Vision System (CVS), fusing enhanced and synthetic vision for superior situational awareness in low-visibility conditions, while the Predictive Landing Performance System delivers real-time runway analysis to reduce the risk of overruns.

Announcing the delivery, Gulfstream president Mark Burns said they had seen astounding demand for the aircraft. "The G800 is entering service with extraordinary program maturity, just like the Gulfstream G700 before it," he said and, "we look forward to customers around the world experiencing the aircraft's remarkable capabilities and cabin comfort".

Ultra-long-range (ULR) business jets have seen a marked rise in popularity in Australia over recent years, driven by a combination of geographical factors and shifting market dynamics. Given this trend and the strength of the local market, the G800 will likely be well-received by customers within our region.

The IBAC International Standard for Business Aircraft Handling (IS-BAH) Recognised in ICAO's Global Aviation Safety Plan

The International Business Aviation Council (IBAC) recently announced that its IS-BAH programme has been recognised in the Global Aviation Safety Plan (GASP) for 2026-2028, which was recently approved by the International Civil Aviation Organisation (ICAO). This marks the first time IS-BAH has been included in the GASP as an ICAO-recognised industry evaluation programme, and the only ground-handling standard listed for business aviation, a significant global distinction for IBAC and the IS-BAH team.

Terry Yeomans, IS-BAH Programme Director, said, "It is an honour to be recognised by the ICAO Council in the new GASP. This recognition embodies the mission we set out with when we launched IS-BAH in 2014. We continue to advocate for continuous improvement within this ground-handling safety standard, regardless of the size or scope of the organisation, anywhere in the world."

IMAGE: GULFSTREAM

ABOVE: The Symmetry Flight Deck sets a new benchmark.

Locally, participants at CASA's 2025 Sector Safety Risk profiles for both the Business Aviation and Ground Handling sectors flagged the risk of ground handling incidents as a top-tier concern, and business aircraft operators are clear on the critical role ground handling services play in the overall safety of their operations.

The IS-BAH Programme is well-supported within Australia, where ABAA Industry Members Execujet (Luxaviation Group), Jet Aviation and Platinum Business Aviation Centre all maintain IS-BAH registration and demonstrate a consistent commitment to business aviation safety excellence across multiple FBO locations.

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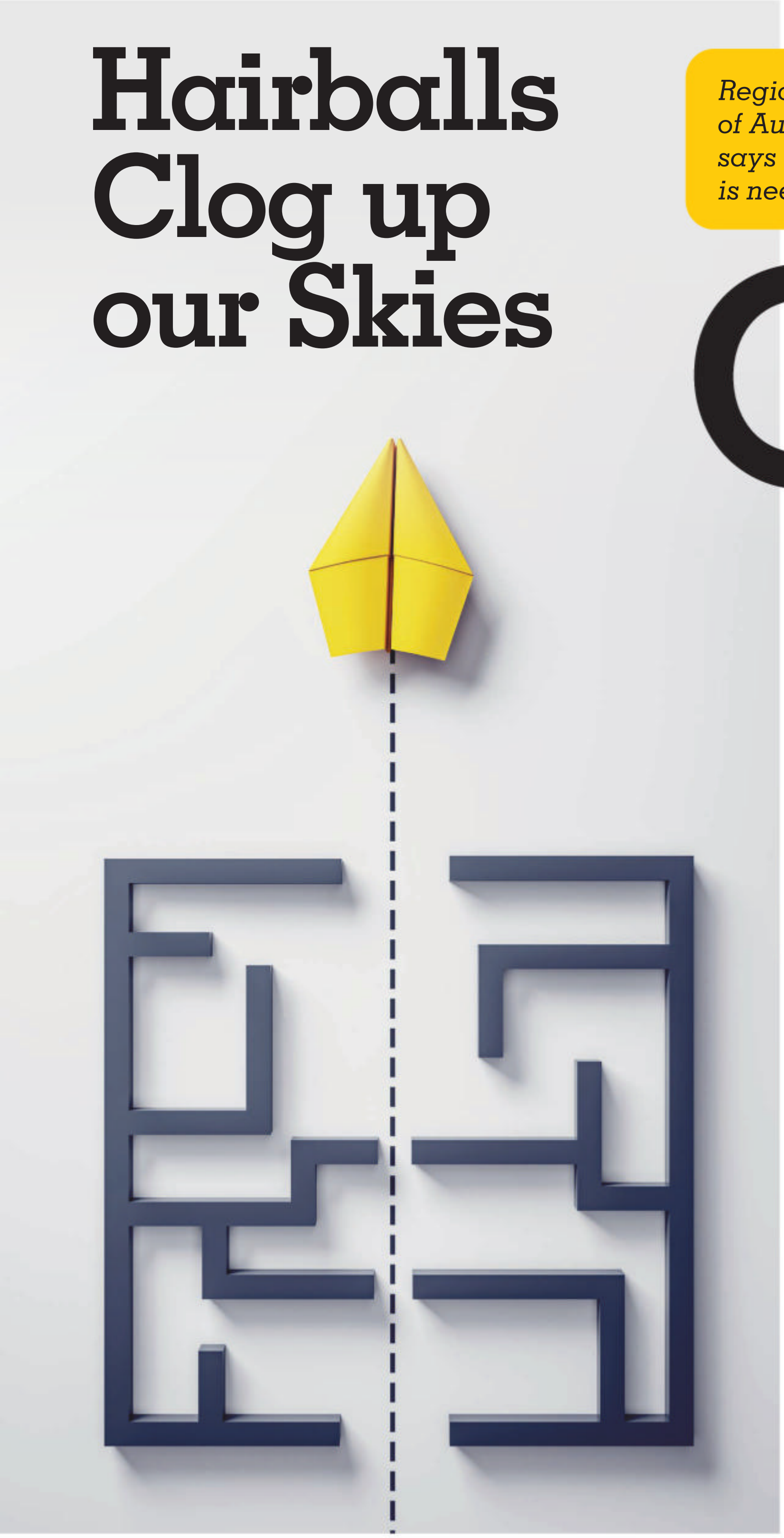
Reports from the Regions

ROB WALKER

As the CEO of the RAAA, Rob Walker is an advocate for voice of regional Australian businesses. He is well known across the industry for his government experience with Airservices Australia and CASA.

Hairballs Clog up our Skies



Regional Aviation Association of Australia CEO ***Rob Walker*** *says an honest and open look is needed into aviation costs.*

Cats and aviation have a common problem - hairballs. While cat hairballs are a consequence of keeping clean, aviation's hairballs stem from a tangle of economic issues that are making us less productive and in the longer term poorer.

Getting rid of hairballs for cats is mostly easy as they cough them up once or twice a month. Aviation's hairballs have grown over time and will be harder to shift.

Regulatory, industrial and cost input issues have become a tangled clump which is choking growth and investment. Unless everyone who has played a part in creating the blockages understands the problem and starts taking action, our future, particularly in regional aviation, will be shackled.

We need governments, businesses, unions and the community to understand the economic challenges we face and to work together to find solutions.

The good news is the Productivity Commission will be holding an inquiry into regional aviation in the near future, which will provide an important opportunity to start the process of shining a light onto all the cost and other pressures faced by the aviation businesses that serve regional and remote communities.

The inquiry flows from a recommendation made in the Federal Government's aviation white paper, which said the Productivity Commission should look at the determinants of regional airfares and advise on policy options to maintain services at acceptable prices.

Earlier this year Federal Minister for Infrastructure, Transport, Regional Development and Local Government, Catherine King, when talking to the ABC about the situation faced by REX, acknowledged the magnitude of the challenges facing regional aviation businesses.

Ms King said, "it's costly to run an airline" and "aviation is a really fickle and difficult business".

It's encouraging that the Federal Government recognises the specific challenges facing regional and remote aviation ahead of the upcoming inquiry. During a radio interview, Ms King said the inquiry may examine how much regional airports pay for security and whether a levy on tickets for other routes could subsidise regional flights

The RAAA welcomes the Productivity Commission inquiry because we want a torch shone into all the dark corners to show the financial pressures on regional and remote operations so the community can get a better understanding of where the revenue from tickets goes. The inquiry needs to look at the impact of over-regulation, labour costs, fuel prices, airport charges, navigation fees, handling charges, security charges and more.

The outcome we should all want from the inquiry is a pathway that will enable regional aviation to become even more productive, so it can deliver better services to the Australian community.

Regulatory hairball

In the area of regulation, no one argues that safety rules are unnecessary, as we operate in an

> « Regulatory, industrial and cost input issues have become a tangled clump which is choking growth and investment. »

activity with inherent risks which must be managed for the benefit of participants and the public. Safety standards that address identified and quantified risks are essential and must be supported with compliance.

It's when the regulations build up strand by strand over time, with new regulations adding complexity to existing ones, that a hairball forms which can clog efficiency, innovation and productivity, and damage economic performance.

During 2025 it was heartening to see a widespread focus on this issue as part of the push to revive Australia's economy. Finally, it seemed, the often-solitary voice of the aviation industry in calling for a better balance between necessary regulation and productive business was joined by many people, including from key institutions such as the Reserve Bank and the Productivity Commission.

On top of regulatory costs we know that the cost of goods and services have increased significantly in recent years, many of which are inputs into businesses, such as more expensive fuel, electricity and fees for services.

Aviation businesses, particularly those operating in regional Australia, have been hard hit by a storm of cost input increases that simply can't be avoided but are hard to recover from ticket prices. Regional air operators know their customers have been struggling with their own cost imposts and their ability to pay more is limited.

Just one example of the extent of the input cost issue is the move by Darwin Airport to increase landing fees by 110 per cent, making it the most expensive capital city airport in the nation. An alternative pricing model put forward by general aviation operators was rejected by the airport management company, despite the unique role smaller aviation operations play in connecting the people of the Territory.

Airservices Australia is currently preparing a new Long-Term Pricing Agreement to cover the five-year period from 1 July 2026 to 30 June 2031, which will set prices for en route, Terminal Navigation, Aviation Rescue and Fire Fighting services. Even before this Agreement has been finalised Airservices has flagged there will be increases in their charges.

On top of these financial issues facing aviation businesses there are emerging cost burdens from industrial relations activity. A legal decision was made during 2025 on how standby duty for pilots is treated from an industrial relations perspective, and other issues are before the Fair Work Commission relating to the award covering some pilots and cabin crew.

While the RAAA and its members respect the right of pilots and cabin crew to pursue workplace improvements, any changes must be balanced by productivity improvements that allow regional aviation businesses to meet the increased costs without simply passing the buck to passengers. If ticket prices are beyond the ability of community to pay, then demand for flights will drop, work for pilots and crew will dry up, and businesses will contract.

We need a fair, open and transparent examination of regional aviation so everyone can see where the money is going and how we can work together to lift productivity and improve the services we deliver to the community.

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*As you make plans to head off for the summer holidays, do they include refreshing or updating your flying knowledge and skills? **Pip Spence** explores the importance of continued education.*

A Culture of Safety

Education is a major plank of CASA's approach to boosting safety and in our 30th year we have more resources than ever to help you fly safely.

A key innovation over the past 4 years has been our pilot safety campaign, 'Your Safety is in Your hands', which is continuing to have strong engagement.

Nine out of 10 pilots are aware of it, with many saying it prompted them to reflect on how they plan and fly, speak to others about safety or adopt safer practices.

It is regularly updated and as we head into the northern wet season, we are focussing on the important subject of weather and forecasting.

Hazards during the hot, humid Top End wet season include poor visibility, severe turbulence, icing and lightning.

It can be a particularly fraught time for visual flight rules (VFR) pilots and we have a series of webinars and seminars being published via the pilot safety hub and CASA Briefing YouTube channel.

But keeping an eye on the weather and knowing what might be ahead of you is important no matter where you are.

Accidents sadly remind us about the risks of flying into bad weather with a potentially fatal loss of situational awareness.

> « Accidents sadly remind us about the risks of flying into bad weather with a potentially fatal loss of situational awareness. »

Like the other topics on our pilot safety hub – non-controlled operations, flight planning and controlled aerodromes and operations – weather and forecasting includes valuable insights from other pilots and experts, Australian and international articles, animated explainers, quizzes, podcasts and videos.

These include the chilling 56 seconds to live video about a fatal helicopter flight from visual meteorological conditions (VMC) into instrument meteorological conditions (IMC).

There's a quiz that allows you evaluate your skills and knowledge and you can also take our aviation safety pledge.

The pledge publicly demonstrates a commitment to safety and mentorship and as of mid-August, more than 500 pilots and aircraft maintainers had joined 130 organisations in showing their support.

A culture of safety is built not just on commitments but also on practical application.

That's why we've also launched a new set of resources.

The new Building Mental Models: Radio communication at non-controlled aerodromes worksheets aim to help early-career pilots strengthen their awareness of airspace and traffic.

Through realistic scenarios at non-controlled aerodromes, pilots can practise recognising and interpreting radio calls, building spatial awareness and making quick decisions.

Pilots work through audio recordings and visual exercises to predict aircraft performance, speeds and circuit positions to help improve decision-making in real time.

Other resources are available through publications on our website, include our popular Visual Flight Rules Guide (VFRG) and the Stay on Track series.

We regularly update the VFRG to help pilots prepare, plan and fly safely.

It covers issues such as knowing your rules and responsibilities, flight planning, radio communication procedures, decision-making and hazards, and dealing with emergency situations.

The VFRG is complemented by our series of animations explaining the rules, which take key sections of the publication and present them in an easy-to-understand, visual format via the pilot safety hub.

Stay on Track booklets help VFR pilots become familiar with a particular region and gain greater understanding of issues such as military procedures, airspace infringement hotspots, tracking and reporting point information and weather.

We now have print and online issues available for the Brisbane, Gold Coast, Perth, Darwin, Melbourne, Adelaide, Townsville and Cairns regions.

And as we're now in the fire season, it would be remiss of me not to remind everybody to stay well away from emergency service activity and fire boundaries.

Planning ahead is a key theme running through much of our safety advice and it will help you have a safe and trouble-free summer break.

All the best, Pip

Fit to Fly

ROBERT MASSERA

Dr. Rob Massera MBBS, BMSc (USyd), is a private pilot and CASA designated aviation medical examiner (DAME), who loves flying, aviation-medicine & keeping pilots in the air.

Our ability to fly depends not only on our training and skills, but also on maintaining a valid CASA medical certificate. Loss of certification can be just as career-limiting as a licence suspension. ***Robert Massera*** *looks at the five threats to our health.*

Australian Government
Civil Aviation Safety Authority
Reconsideration Form
Card Expiry(mm/yy)
What do you think the decision should be?
Why should CASA make this decision? (Please provide medical reasons for this)
Why is this change important for you? (Provide reasons why the change will facilitate your work/hobby)

The Big Five

In life, and in aviation, something will eventually ground us - permanently. None of us live or fly forever. Some threats are in the lap of the gods: a brain haemorrhage, a rare cancer or an accident beyond our control. There is no use worrying about what we can't predict or prevent. However, the good news is that the majority of threats to our medical certification are predictable and preventable. By understanding and recognising these threats, we can apply countermeasures, correct course and keep ourselves healthy, certified and fit-to-fly.

Do you know how to avoid a STALL?

In aviation, we all know the dangers of a stall: it creeps up as our airspeed bleeds away, and by the time you feel the buffet, recovery requires urgent, decisive action. The same principle applies to the big 5 preventable threats to your health as a pilot. You can think of them as STALL threats:

S – Sugar (Diabetes): Rising blood glucose usually goes unnoticed until it's picked up on a blood test IF you see a GP regularly. Impaired fasting glucose, pre-diabetes or type 2 diabetes increases your risk of heart disease, eye disease and impacts your medical.

T – hyper-Tension (High blood pressure): This is a silent threat that typically develops without symptoms. Left unmanaged, it increases your risk of heart disease, stroke, eye disease and kidney disease, all of which threaten your Class 1,2 or 3 medical.

A – Arteries (cardio-vascular disease): Heart-disease is a common issue in men and pilots over the age of 40. Coronary artery blockages, angina (chest pain), or heart-attack result in lengthy grounding and ongoing surveillance requirements.

L – Lipids (Dyslipidaemia): High cholesterol and triglycerides quietly damage and gradually block blood vessels, increasing the risk of cardiovascular disease, stroke and eye disease down the track.

L – Load (Overweight/ Obesity): Carrying extra kilos of fat (excess fuel) doesn't just affect your figure - it multiplies the risk of all these threats (and others) to your medical certification.

Together, these STALL threats are the most common cause of medical certificate suspension, loss or ongoing surveillance requirements in pilots. The good news is they develop gradually and are mostly preventable or manageable. Through awareness, early recognition and appropriate countermeasures we can avoid a "stall" in our health and medical certification.

What are the other common preventable threats?

Beyond the STALL threats, there are several other common preventable or manageable conditions that frequently impact pilots' medical certification:

Anxiety, Depression and Mental Health: CASA takes mental health seriously, and untreated depression can ground a pilot. Early support and management often allow certification to continue.

Kidney Stones: Small, extremely painful and unpredictable. An attack of renal colic in the cockpit is incapacitating. Good hydration and a healthy diet can reduce the risk.

Lower Back Pain: Common in pilots due to long hours sitting and cockpit ergonomics. Chronic pain and medication use can complicate certification. Regular core-strengthening exercises can mitigate the risk.

Preventable Cancers: Skin, bowel, prostate and breast cancer are common in Australia. Sun protection, screening and early detection can make the difference between flying and lengthy grounding.

Hearing Loss: Noise exposure is part of aviation. Use of hearing protection, noise-cancelling headsets and regular audiometry help preserve hearing & meet the CASA standard.

Ageing: Not a medical condition per-se, but an undeniable risk factor for hypertension, cardiovascular disease and most cancers.

Regular maintenance is the key to maintaining our "airframe" and mitigating all of these threats to our medical certification.

So, what's the take-home message, Doc?

Your health and medical certificate matter as much as your licence. The main threats to certification aren't sudden or rare, but common, preventable conditions that build over time. By applying the TEM framework to our health, we mitigate risks and stay fit-to-fly longer, for years to come, safely.

Right hand seat

DR RANTY MCFLARESALOT

The Weakest Link

Welcome, dear readers, to more of the rantings, ravings and otherwise opining, of your correspondent, **Dr Ranty McFlaresalot**, FaRCe, ChMTRaLR, retired, obsolete.

TL;DR :

It's about time we stopped bullshitting.

Recently, a plane went missing. Somewhere between Tasmania and NSW. No trace of where it is (maybe it's been found by now? The odds? Spectacularly low). Roughly quoted in an article in the ABC news website, was this old chestnut:

'It's more dangerous to drive to the airport than to go flying'

cough Bullshit *cough*

Richard Feynman said it best, 'The first principle is that you must not fool yourself, and you are the easiest person to fool.'

I'm not sorry for quoting one of the greatest minds of the last century. Any instructor who reads this, should read his articles on teaching. Really. Now. You can thank me later. Broaden your mind, sausage factory 'graduate'.

Now to address that quote, or at least give it some context.

It would be more dangerous to drive to the airport to go flying IN A LIGHT AIRCRAFT ON A PRIVATE FLIGHT, IF you drove there, at night, during a thunderstorm, on a motorbike. Roughly.

Big burners are very, very safe. Little planes, and in particular, the people that fly them (mirror mirror, on the wall, who's the idiot you're looking at, YOU!) are NOT.

When we bullshit (fool) ourselves, we make terrible decisions. We fly without flight plans, we fly through bad weather, we fly long trips over tiger country in planes straight out of maintenance, we do unplanned aerobatic maneoevres in formation flights, we don't follow our checklists and forget to set rudder trim/fuel taps/whatever. We get ourselves, and anyone unlucky enough to be in the plane with us, killed.

While the CASA Human Factors material consists of mainly a stupid game of pin the tail on the donkey (which particular class of error is this thing? HOW DOES THAT HELP?!), and the RA-Aus human factors material is asking is it ok to fly after a fight with your partner (slightly more relevant, for a change), and they all ignore risk management, this stuff will continue to happen.

Flight is about risk management.

We take a calculated risk every time we get in a plane and contemplate gracing the heavens with our presence. We love to fly, but if we're making risk decisions based on bullshit, we will swing the odds further away from our survival.

> « We take a calculated risk every time we get in a plane and contemplate gracing the heavens with our presence. »

One of my favourite things to teach is the RA-Aus 'passenger endorsement'. It's an opportunity to really instil into a new pilot this life-saving rule; Always have a plan B. This Plan B is 'let's go to the local *somewhere nice/fun* instead. By car.'

You are the weakest link in the chain, but you can be better.

Be better.

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YAFFA 16693

What can we learn?

JIM DAVIS

Jim Davis has 15,000 hours of immensely varied flying experience, including 10,000 hours civil and military flying instruction. He is an established author, his current projects being an instructors' manual and a collection of Air Accident analyses, called 'Choose not to Crash'.

No Turning Back

CAA ACCIDENT REPORT SUMMARY: This report is to advance safety, not to assign fault or liability

INCIDENT DETAILS

A/C: C 150B, C-GFFG with tailwheel conversion

Place: Alexandria Aerodrome, Ontario

Date: 26 July 2023

HISTORY OF FLIGHT

On the morning of 26 July 2023, the pilots met at Lachute Aerodrome, Quebec, to conduct a day VFR flight to familiarise one pilot with tailwheel flying.

There was a delay at the refuelling station, so they did not add fuel. They flew to Hawkesbury, Ontario, where the 2nd pilot practiced take offs and landings. At about 11.30 local time they landed and shut down. About an hour later they took off and headed to Alexandria Aerodrome, Ontario. They arrived at 12.55 and completed 2 circuits on runway 25. They then repositioned for take-off on the threshold of 25.

At 1310:57 a cockpit mounted GoPro showed that shortly after take-off, and below 200' AGL, they had a momentary partial power loss. The instructor, in the right seat, took control and performed a 180° left turn for an approach to runway 07.

During the turn there were two more partial power losses. They banked steeply and re-aligned about half-way down the runway. At 1311:35, with less than 1000 feet of runway remaining, the instructor applied power before touchdown and initiated a go-around.

Seven seconds later, during the climb, the aircraft was just below 100' agl and the ASI was fluctuating between 50 and 60 mph when the flaps were retracted from 10° to the UP position.

Two seconds later the engine revs decreased from 2450 to 1300 rpm. The instructor began a steep right turn during which the airspeed decreased and the bank increased to about 45°.

Six seconds later the aircraft stalled, continued to roll to the right. It descended in a steep nose-down attitude, and collided with terrain.

The instructor was fatally injured. The 2nd pilot was critically injured and was transported to hospital.

The aircraft was destroyed. There was no fire.

WEATHER INFORMATION

The weather was VMC with very strong, gusty winds from the west-southwest.

PILOT INFORMATION

Both pilots held appropriate licences, ratings and valid medicals The instructor, with 1120 hours, held ratings for seaplanes and aerobatics. He also held a glider pilot license.

The 2nd pilot held a PPL and had 122 hours.

ACCIDENT SITE AND WRECKAGE EXAMINATION

The aircraft systems were examined and no malfunction was found. There were no signs of fuel leaks or contamination. 2.7 US gallons of fuel remained in the tanks.

There were no signs of catastrophic engine or mechanical failures.

Both pilots wore 4-point safety belts consisting of lap straps and shoulder harnesses. However, once the harness is tightened it limits arm movement, and some areas of the cockpit and instrument panel may be out of reach. The video shows that the instructor's harness was very loose throughout the flight.

AIRCRAFT INFORMATION

The 1962 Cessna 150B had been modified to tailwheel configuration.

The POH says a wings-level, power-off stall, with the flaps at 10° occurs at 53 mph. With flaps UP this increases to 54 mph. With 40° bank the stall speed increases to 62 mph; and at 60° of bank the aircraft stalls at 77 mph.

The stall warning sounded as they approached runway 07, after the low-level 180° turn. However, it did not sound before the final stall-spin. The investigation could not determine why it failed to work at this stage.

FUEL CONSIDERATIONS

The POH requires pilots to visually check the fuel quantities, and to confirm this by checking the gauges.

The aircraft's calibrated dip stick had been broken for some time and was not available. The investigation determined that pilots operating this aircraft rarely, if ever, used a dip stick. Instead, they visually inspected the fuel levels, or relied on the gauges.

The total usable fuel was 22.5 US gallons, and the unusable fuel was 3.5 gallons.

The fuel gauges are marked E for empty, ½ for half full, and F for full, with graduations at ¼ and ¾. The gauge readings from the previous flight were estimated at ½, and slightly below ½. If these readings were accurate, this would give 5.6. gallons in one tank and slightly less in the other.

The gauges in this model are known to be inaccurate and unreliable [Jim's emphasis].

For day VFR flights, Canadian regulations require the aircraft to carry sufficient fuel to fly to destination, plus 30 minutes at normal cruise speed. The aircraft did not meet this requirement.

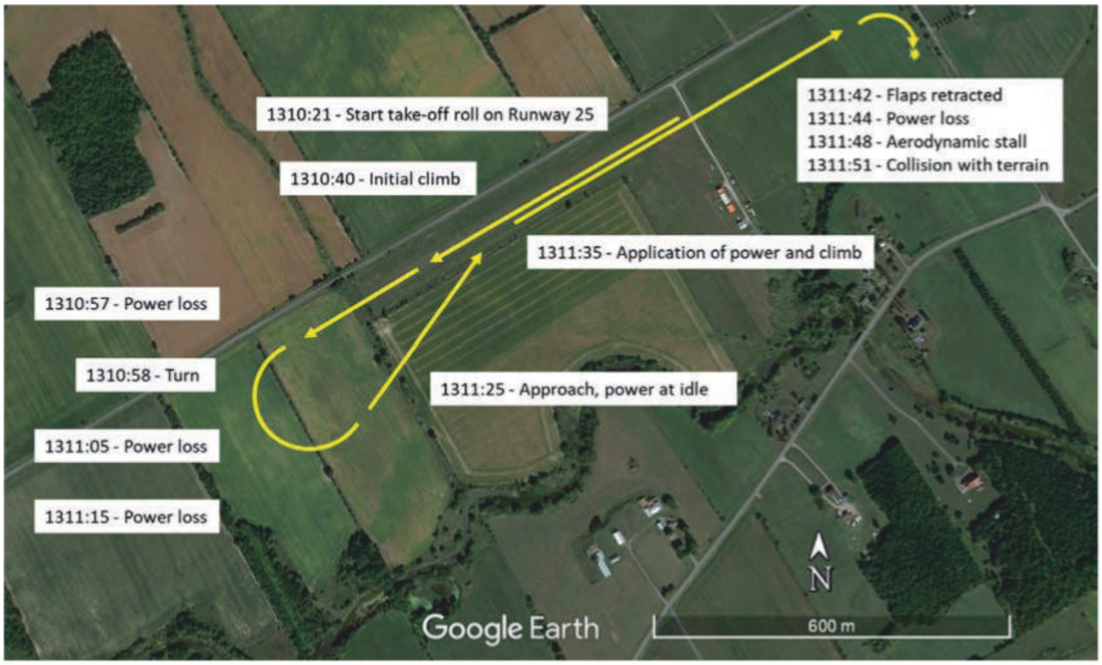
Given the weight of the occupants, cargo and fuel, the aircraft was overweight by about 69 pounds at the start of the flight.

ENGINE FAILURE AFTER TAKEOFF

Many fatal accidents result from pilots trying to turn back following an EFATO. This often causes a stall or loss of control at low altitude.

The FAA recommends that 180° turns be avoided and suggests using the best available landing area within an arc of about 60°.

Aiming to make safer pilots of us, here veteran instructor Jim Davis looks at extracts from official CAA Accident Reports from his homeland of South Africa and analyses why things went wrong and how we may all avoid making similar mistakes.


1310:21 - Start take-off roll on Runway 25
1310:40 - Initial climb
1310:57 - Power loss
1310:58 - Turn
1311:05 - Power loss
1311:15 - Power loss
1311:25 - Approach, power at idle
1311:35 - Application of power and climb
1311:42 - Flaps retracted
1311:44 - Power loss
1311:48 - Aerodynamic stall
1311:51 - Collision with terrain
N
Google Earth
600 m

ABOVE: Diagram detailing the series of events that led to the collision.

Jim's Comments

The message here seems to be a matter of repeating the old warning about not turning back. However there's quite a bit more to this.

First, let's deal with this ridiculous, and oft repeated, message that you should avoid turns of more than X° following an EFATO.

Why on earth specify any number of degrees? If you are at 50' your turn has to be very limited, and if you are higher then the amount of turn depends on the aircraft type, the wind, your skill and a herd of other factors.

In a Grob at 200' you can circle back to your departure runway. In a Bonanza at 200' your landing spot is directly ahead.

Why put numbers to it? You simply turn towards the best available field. It couldn't be easier. That's what the RAF and the SAAF recommend. It makes perfect sense.

Next, this modified and seemingly unloved Cessna didn't stand a chance. Unloved? Absolutely. The dipstick was lost ages ago and no one cared to replace it. It would have saved the instructor's life.

And then there's the word calibrated dipstick. Making a new one is a tedious, but critical job. You must drain all the fuel and then mark the new dipstick bit-by-bit as you add say two gallons at a time. Here are some pointers:

1. The normal Cessa dipstick must be banned. It doesn't read correctly for the tailwheel version.
2. The aircraft must be on level ground – fore-and-aft and side-to-side.
3. Don't expect the gauges to agree with your calibration – they are made for the level flight attitude.
4. Use metal or very hard wood for the stick – the fuel creeps up soft wood alarmingly.
5. Don't varnish or paint the stick – the fuel may dissolve it.
6. Put a 'T' piece across the top so you can't drop it in the tank.

So it seems we have a classic stall-spin during an attempt to turn back following an EFATO. But there's more to this.

The engine didn't fail – the pilots failed. They didn't put fuel in at the start of the flight. They made the fatal mistake of being in a hurry. They couldn't wait for the original holdup at the pumps. So this crash seems to have been caused by being in a hurry.

But wait – there's more. What was the pilot thinking when he decided to do a go-around with a faltering engine? He had 1000' of runway ahead and a C150 with full flap can get down and stopped in a very short distance.

And why retract the 10° of flap at low altitude and low airspeed during the go-around? That makes no sense.

Next, the instructor, who had both a glider license and an aerobatic rating, should have been acutely aware of the dangers of increasing bank while running out of airspeed. It's also possible the instructor may have survived had he tightened his shoulder harness correctly.

Perhaps the whole accident should be put down to the operator's slack attitude to safety. When pilots trust their lives to fuel gauges that are known to be inaccurate and unreliable this speaks volumes about the operator's casual attitude to safety culture. The statement that pilots "rarely if ever" use a dipstick, or even look in the tanks, underlines this view.

And, as a final indication that all was not well with the operation, we have the statement that the aircraft was over maximum gross weight by 69 pounds as well as being out of C of G.

What can we learn?

- Knowing your fuel quantity before takeoff is not a check it's a life or death essential.
- A calibrated dipstick is part of the life and death thing. It's not only used for little aeroplanes – The pilots of Boeings and Airbusses do exactly the same thing. If they are not sure of the fuel quantities they use a dripstick which works the same as a dipstick but it is done from under the wing.
- When professional pilots use this back-to-basics method then then I also want to be professional. How about you?

CASA's Workplan 2.0 will put licensing back under the microscope with a review of Part 61.

Working the Plan

CASA's GA Workplan 2.0 promises more regulatory reforms for GA. ***Steve Hitchen*** *lays out some thoughts on a selection of issues.*

CASA's GA Workplan 2.0 landed back in July, outlining what the regulator believes it can do to help reduce burden on general aviation. The GA workplans are not light-weight documents; they outline initiatives and provide supporting detail and scheduled timelines.

But it is a plan, and one thing aviators understand is that plans are just the datum from which to measure the deviation of what really happened. Whilst that axiom is generally applied to in-flight scenarios, it is equally appropriate for trying to introduce regulatory reform as well. Despite best efforts, sometimes the plan just doesn't work.

So it is pleasing to note in the latest workplan that CASA intends to knuckle down again to sort a couple of long-standing regulatory thorns that continue to irritate our sides. Some of these are carry-overs from the first workplan that needed more work than first anticipated, defying schedules and extending into the revised version. I speak mainly of:

- CASR Part 43 GA maintenance
- Class C and D access for RPLs
- Improving LAME numbers.

Of these, CTA/R for RAAus' pilots should have been a slam dunk. The new policy permitting this was published in December 2024, but isn't as yet in force. According to the workplan, it should be implemented about, well, now. But there are contingencies that require RAAus to have processes in place, which is CASA pointing out that this project may be delayed by external entities not getting their act together in time.

And Part 43? This is just a disaster. The next great thing of 2018 has descended into a tragedy of objection and regulatory brick-walls that has stymied momentum. Stripped of much support from the GA community, CASA has pushed this out to Q4 2028, by which time it will be a decade downrange from the initial promise. Expect this one to get a guernsey in Workplan 3.0 as well.

And I suspect some of Workplan 2.0's original initiatives might give CASA some headaches as well: public benefit flying, Part 61 review and recognition of military instructor qualifications. These three will, I believe, prove tougher opponents of reform than anyone thinks.

Public benefit flying was not even on CASA's radar until an ATSB investigation fingered Angel Flight administration as a factor. The regulator then imposed new rules that were confirmed by the courts, rules that added restrictions but did nothing to address the reason why that particular crash occurred. Reforms to this area are likely to add more restriction.

Checking CASR Part 61 against originating policy has more worms than a mangy dog. Introduced over a decade ago, the intervening 11 years have been spent beating the regulations into a useable shape. Workplan 2.0 touts more modifications to Part 61, so the regulation has become a living thing constantly under review.

Comparing what it has become against the original policy is probably a fair thing to do, but there is danger using the original policy as the benchmark and not the actual effectiveness of the regulation. If Part 61 has had to be modified this much to be effective, perhaps it's the policy that needs to be questioned.

And whilst I deliver in-principle support for recognising military instructor qualifications, it comes with a codicil. Having spent time instructing in the Australian Army, I know that the military style is very structured and deamnding. That's fine for soldiers, but when directed at teenagers infused with the new joy of aviation, it'll go down like a bath thrown off a building. Recognition of skills is fine, but some style tweaks will be needed.

But, overall we need to be thankful there is any workplan at all. CASA has the power to impose, and although consultation is mandatory, accordance is not. When putting together this workplan, the team behind it would have gone through looking for inclusions, which is tantamount to recognition that things are there that can be fixed.

We haven't been able to bask in that attitude from a regulator too often.

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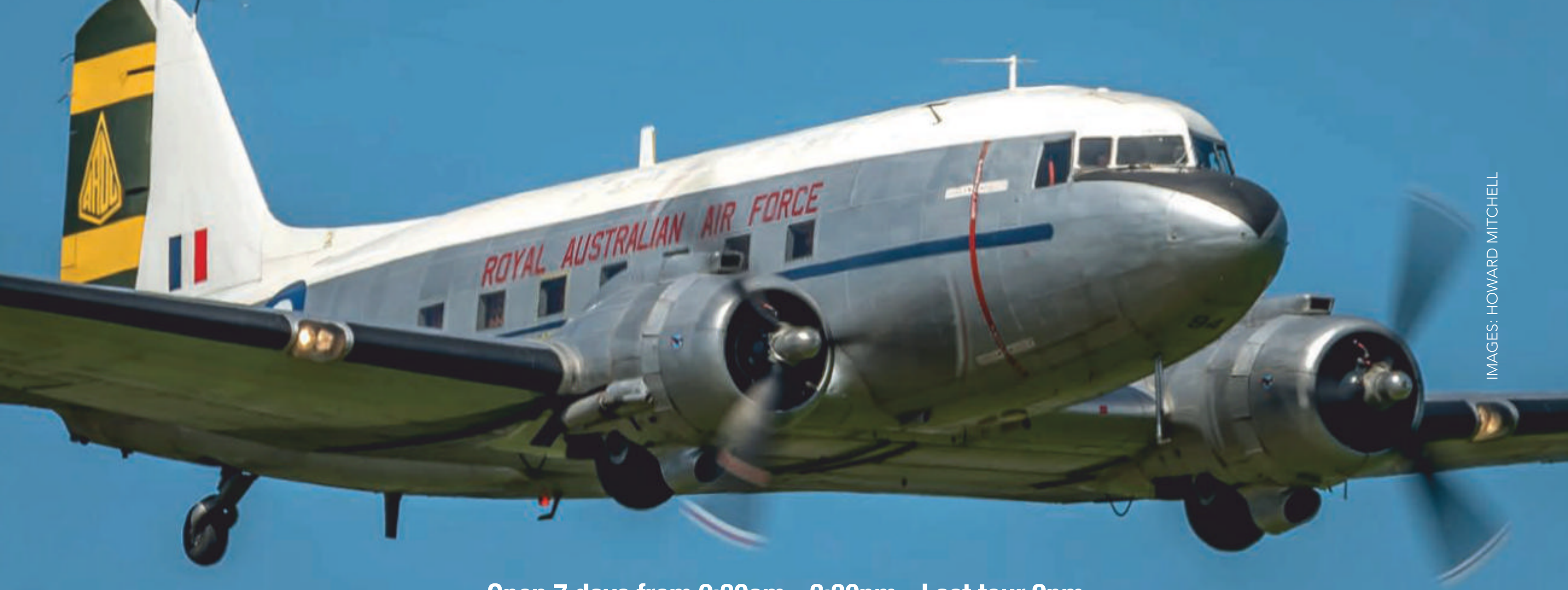

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